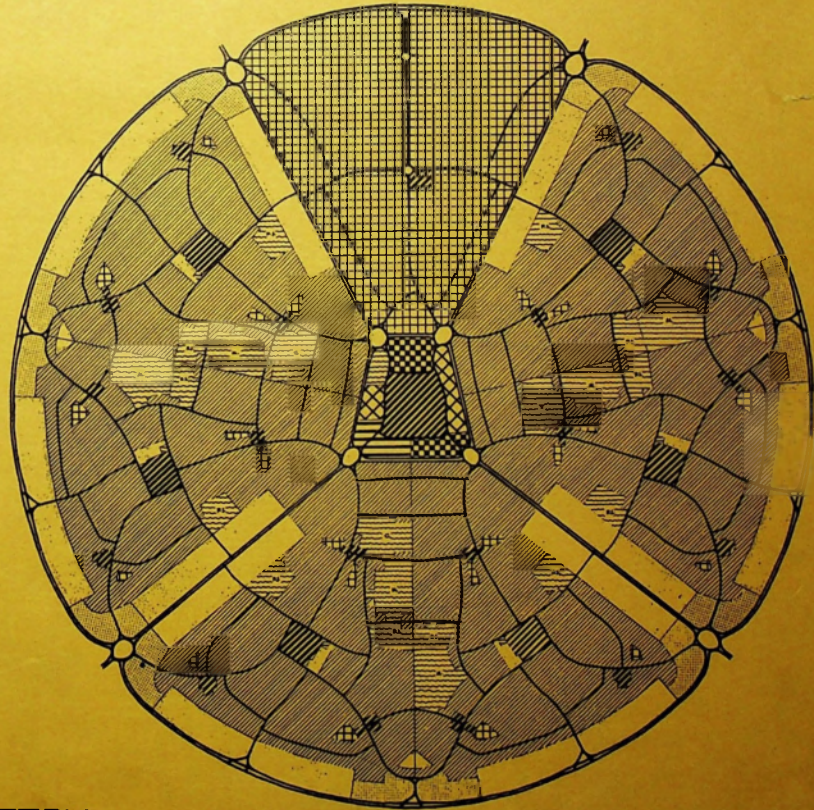


PRINCIPLES AND PRACTICE OF TOWN AND COUNTRY PLANNING

LEWIS KEEBLE



2nd EDITION COMPLETELY REWRITTEN

The author writes about this book:—

When I was asked to prepare a second edition of " Principles and Practice " I was doing some research which I felt must be incorporated in it. Since the publication of the first edition a good deal had happened in the Planning field. Dispute had flared up again over compensation and betterment; the blessed word "urbanity" and the accursed word "sprawl" were being increasingly used in emotional juxtaposition to attack space standards which seemed to me essential for a good physical environment.

On the other hand, Wibberley and his colleagues had triumphantly shown, among other things, that, at the very least, the density of residential development was irrelevant to national food production; and Lichfield had pointed the way to an exciting new method of comparing and evaluating different solutions to planning problems.

The main thing that these two pieces of work had in common was that they offered objective and scientific methods to help determine planning policy, and I wanted to extend this objectivity as far as possible to the study of space standards for urban uses, though I realised that reliable information was so scanty that I could not hope to get very far.

First, in relation to Regional Planning, I did some calculations about the spacing of communities and their physical size which showed, principally, that talk about low densities leading to " Subtopia from Southampton to the Wash " was indeed eyewash. I also showed what a remarkably small effect upon *town* size is produced even by large variations of net *residential* density.

Next, I tried to demonstrate the effect of developing a town in which there are no irregularities to confuse the issue, and in which specific space standards, some of them generally accepted, are adopted for each use, so that the reader can see what a town would be like if deliberately planned from stem to stern in accordance with ideas which have each, individually, been tried out but have not been fully combined in any one place. Having done this for the town as a whole, I applied the same method to each of its parts.

The important matter of composing all this into visual harmony in three dimensions is hardly more than hinted at, but I hope to have shown that the methods and standards used are capable of producing a town which would be delightful to live in from every point of view.

Finally, I wanted to rearrange the book so that its parts, chapters and sections knitted together more easily and logically. To secure this I have now put all matters of law and administration together in Part III; I have separated survey into regional and local, each portion being placed conveniently in relation to the chapters on regional planning and town planning; and, with the very skilful help of my friend Lawrence Baker, I have worked out a set of town surveys and proposals which relate to and link up with one of the towns in the Regional Plan given as an example, thus, I hope, illustrating emphatically the continuity of the planning process.

No doubt the book is still full of imperfections, but I believe it to be much improved.

Price 50/-
(Postage 2/- Extra)

BIOGRAPHICAL NOTE

Lewis Keeble was born in 1915 and was educated at Tonbridge School. Articled to a firm of Chartered Surveyors he soon found that Town and Country Planning was the only subject with which he came in contact which interested him much. His articles were transferred to W. R. Davidge, with whose firm he has, with longish intervals, had happy connections ever since.

He spent most of the war in the infantry, and emerged with the M.C., a timely and convenient wound and a rooted dislike of arbitrarily exercised authority.

From 1945 until 1950 he was on the staff of the Kent County Council Planning department, and learned a great deal from James Adams.

He began part-time teaching at the Regent Street Polytechnic and the College of Estate Management, and, in 1950, became a full-time lecturer in the School of Town and Country Planning at the University of Manchester, where he helped to establish the five-year undergraduate course in Planning which had been started there. He also lectured to Engineering students at the College of Technology.

In 1955 he moved to London to become senior lecturer and director of studies in the Town Planning department at University College under Sir William Holford.

In 1956 he was elected a member of the Council of the Town Planning Institute, and in 1957 became Honorary Editor of the Institute's Journal.

Apart from teaching and work on the preparation and administration of planning proposals he has had much experience as a technical witness at planning inquiries, work which he finds particularly enjoyable and stimulating. He sits on numerous professional and academic committees, and examines in Town Planning subjects for several bodies.

Keeble is a firm believer in the need for a more thorough and scientific approach to Planning in order to establish reliable methods and standards and to achieve more than what he regards as the rather patchy successes of Planning since the war. In particular he thinks it essential that land should be treated as the raw material for the fulfilment of human needs rather than as an article of merchandise.

PRINCIPLES AND PRACTICE
OF
TOWN AND COUNTRY PLANNING

LEWIS KEEBLE

THE ESTATES GAZETTE, LTD.

PRINCIPLES AND PRACTICE
OF
TOWN AND COUNTRY PLANNING

By

LEWIS KEEBLE, M.C., B.Sc., M.A., F.R.I.C.S., M.T.P.I.

*Senior Lecturer in Town Planning
at the University of London.*

*Formerly Lecturer in Town and Country Planning
at the University of Manchester*

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PREFACE

THE NEED TO PRODUCE a second edition of this book, which first appeared in 1952, provides the opportunity to carry out a thorough revision. The most important change made is to rearrange the order so that Part I deals entirely with Regional and Town Planning, Part II with Planning Standards and detailed Planning and Part III with Development Control and Planning Administration. A similar rearrangement places Regional Survey next to Regional Planning and Local Survey next to Town Planning instead of Survey being dealt with *en masse* as a separate subject.

I have tried to demonstrate more fully the connections between different levels of Planning activity: Regional, Local and Detailed. One of the examples of the Town Planning Process (Figs. 24-32) now relates directly to the Regional Surveys and Plan shown in Figs. 6-14. I have also shown designs for a New Town; free from idiosyncrasies of site and the presence of existing development, these illustrate many of the principles discussed in Chapter 7 and in Part II, and give an example of the various space standards suggested applied to a sufficiently large area for valid conclusions to be drawn from them. These designs range from the Plan for the Town as a whole (Figs. 18 and 19), through its main parts and down to the details of neighbourhood sub-centres and residential layout. The Ideal City is an old enough idea, but I hope that this version of it may be sufficiently detailed and practical to assist readers who find difficulty in relating ideas about detailed Planning to a larger whole.

Compensation and Betterment has recently come back into the forefront of Planning thought, and I have felt it desirable to introduce a brief description of the fundamentals of the problem into Chapter 1.

A new development in Planning ideas, which seems to me immensely important, is the concept of the "Planning Balance Sheet" expounded by Dr. N. Lichfield in his "Economics of Planned Development", and I have tried to explain its importance in preparing a Development Plan.

Apart from these changes, a good many new, and I hope better, illustrations and a new format the book remains much as it was, and I hope that it may continue to give a little help to those trying to master the subject-matter of the bewildering profession of Planning.

LEWIS KEEBLE.

ACKNOWLEDGMENTS

THE WORK OF MOST of the people who so kindly helped me with the first edition remains in the second edition in whole or in part, and it is with pleasure that I repeat my thanks for their aid.

Professor R. A. Cordingley, M.A., F.R.I.B.A., M.T.P.I., read most of the original proofs and made many valuable suggestions for their improvement, as well as contributing an introduction.

Mr. (now Dr.) F. W. Ledger, M.A., Ph.D., M.T.P.I., gave me an immense amount of detailed help.

Mrs. M. Lock dealt very competently with a great mass of correspondence and typing.

Mr. G. B. Dix, B.A., Dip.T.P., M.L.A., A.R.I.B.A., A.M.T.P.I., was my mainstay in preparing many of the illustrations, including the majority of the most elaborate. His work survives especially in Figs. 6-13 of the present edition.

The following also prepared drawings, though I am not now sure which of these is still included:

Messrs. F. W. M. Crombie, J. Crothers, D. Hargreaves, I. C. Laurie, A. C. Smith, D. Thomas and D. J. Williams. (The latter drew the present Fig. 35).

For the second edition I was also fortunate in securing willing help of the highest competence.

Miss K. Backhouse and Miss B. I. Dickson did a very great deal of work, and between them typed practically the whole of the text.

Mr. L. C. Gale, F.R.I.C.S., M.T.P.I., gave me most valuable advice in revising Appendix III (Daylighting).

Mr. W. T. G. Wearne drew and redrew most of the drawing upon which Fig. 56 is based, and was most painstaking in devising methods of presenting it.

Mr. L. F. Baker M.A., F.R.I.B.A., A.M.T.P.I. drew Figs. 14 and 24-31, which seem to me quite outstandingly skilful examples of Planning presentation at an astonishingly small scale. He also helped and encouraged me in other ways too numerous to mention.

Mr. Colin Bridger, Dip. Arch., A.R.I.B.A., drew Figs. 51 and 62.

Mr. C. P. Andren, M.Sc., A.M.I.C.E., helped me greatly in the revision of Chapter 10 by his advice and by supplying much up-to-date information.

Dr. G. P. Wibberley, M.Sc., Ph.D., read most of Chapter 4 in typescript and provided very useful advice and criticism.

Dr. N. Lichfield read Chapter 1 in typescript and also helped with advice and criticism. I am further indebted to him for permission to reproduce extracts from his "Economics of Planned Development."

It is only right to make it clear that in a few respects I did not follow the advice given by the three last named, and they are not to be blamed for any of the opinions I have expressed.

My wife has wholly prepared a number of drawings, viz., Figs. 1, 2, 3, 5, 32, 48, 61 and 63, and has partly drawn a large number of others. She has also given inestimable help by preserving some semblance of order among a huge collection of drawings, many of which my subconscious seemed determined to lose or destroy.

I gratefully acknowledge permission to the following to publish extracts or reproduce drawings and make apology for any accidental omissions:—

Mr. C. B. Purdom: two illustrations from "The Building of Satellite Towns" (parts of Fig. 17). Professor R. E. Dickinson and Messrs. Routledge and Kegan Paul, Ltd.: illustrations from "City, Region and Regionalism" and "The West European City" (parts of Figs. 15 and 16). Messrs. C. D. Buchanan and D. H. Crompton: quotations from "Residential Density" published in the Proceedings of the Town and Country Planning Summer School, 1950. Mr. P. W. Smith and the Oxford University Press: illustration from "The Planning, Construction and Maintenance of Playing Fields" (Fig. 59). The Team Valley Trading Estates Ltd. (Fig. 50). The Stevenage Development Corporation (Fig. 45, part of Fig. 21 and written information). The Association for Planning and Regional Reconstruction: data relating to radii of railway curves etc., from "Town and Country Planning Textbook". The Manchester Corporation: various tables from "The City of Manchester Plan, 1945" and parts of Figs. 54 and 62. *The Manchester Corporation wish it to be made clear that the information given in the tables referred to is not necessarily representative either of the latest available information or the Corporation's agreed planning policy.* Professor R. G. Batson and Messrs. Longmans-Green: two drawings from "Roads" (Figs. 36 and 39). The Crawley Development Corporation: (Part of Fig. 21, Fig. 51 and written information). Mr. E. G. Robinson, B.Sc., Dip.T.P., F.R.I.C.S., F.A.I.: several extracts from our jointly written book "The Development of Building Estates". Messrs. Lund Humphries: (part of Fig. 17). The Worcester City Council and the authors of "County Town" (Part of Fig. 21). Mr. E. Maxwell Fry: illustration from "Fine Building" (part of Fig. 17). The Harlow Development Corporation: (part of Figs. 21 and 62 and written information). The Hemel Hempstead Development Corporation: (parts of Figs. 21, 54 and 62). The Town Planning Institute and the Royal Institution of Chartered Surveyors: various extracts from their respective journals, particularly from papers by Mr. R. H. Best, B.Sc., M.Sc. The Town Planning Review: extract from article by Mr. R. H. Best. The Town and Country Planning Association: (part of Fig. 17). I am specially indebted to Mr. Best for kindly allowing me to draw freely on the valuable material he has collected and presented from time to time.

A number of extracts have been made from H.M.S.O. publications with the permission of the Controller. Separate acknowledgment of each of these is made in the text. This applies also to a number of drawings reproduced from or based upon the Ordnance Survey.

I am again grateful for the help given by my publishers, particularly by Mr. F. P. Wilson.

Finally, my thanks are due to all the printers and blockmakers who have done their very best for me.

INTRODUCTION TO THE FIRST EDITION

By PROFESSOR R. A. CORDINGLEY, M.A., F.R.I.B.A., M.T.P.I.

THIS IS NOT the first comprehensive textbook of Town Planning to be written, but it is different in kind from any that have gone before. It is as practical in character as it can be made. No pet theories are propounded or special pleas offered; the author is not marketing untested ideas. His purpose is to render a factual, objective account of current practice—to review in as much detail as can be compassed in a single work the whole scope of legally-practicable Planning; the mechanism of operation, the type and nature of the problems encountered and the methods and principles applied in their solution. History, as such, here finds no place, and there are no adventurous speculations on æsthetics. In so far as his convictions allow, the author refrains from intruding his own views. Throughout, it is the common or accepted practice he is at pains to discern and to explain. Hence the student will find in this book the authentic guidance he seeks and those in practice are given an unbiased comprehensive account of contemporary principle and method, and a trustworthy work of reference.

Because of its objective nature and comprehensive scope, this book stands, too, as a record of the achievement of modern Planning in this country to date. Despite the venerable history of the art, British Planning, universal, obligatory and touching social interests at almost all vital points, is young—almost completely new. Fifty years is a generous estimate of its age. What real progress has been made in this time? How much of current activities is sheer mechanics and how much actually productive of the intended social good?

It was no part of the author's intentions to concern himself with such abstract questions, but, indirectly, the answer emerges. Broadly, policy is well-established and general principles for the most part are implicitly accepted, but there is yet a good deal of irregularity in the practical application of principle in specific cases, especially in the matter of piecemeal development and in re-development. Some of the problems of Planning repeatedly occur, and there is now an accumulated experience in the solution of them; others so far have only sporadically appeared and the specifics that have been applied consequently are sometimes found to have taken completely opposite trends. Again, when the general picture is presented there are seen to be quarters into which Planning principle has not yet penetrated. In all connections there is the further point that reliable factual data on which to base decisions all too frequently is lacking, since the field for research in Planning is very broad indeed and the modest resources so far available mostly have been concentrated upon the more pressing investigations.

From time to time, therefore, in order to present an entire and consistent account, the author has been obliged to relax his intention to confine himself to objective reporting and himself to bridge gaps in present experience or to arbitrate as to correct procedure whenever practice appears in conflict either with its own precedents or with general principle. In all such cases the grounds for his recommendations are fully stated.

Mr. Keeble writes from personal, first-hand experience. In all sections of his book he is on familiar ground and speaks with an authority allowed by an intimate knowledge of his subject. The breadth of his experience permits him to go directly to his points and to compress a very considerable body of skilfully sifted factual information within a small compass. Illustrations are drawn from a wide range, and in the course of his exposition many major Planning projects are submitted to comparative evaluation. Written in succinct, breezy style, revealing an irrepressible energy and humour, the book makes attractive as well as informative reading.

R. A. CORDINGLEY

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PART I

REGIONAL AND TOWN PLANNING

CHAPTER 1

DEFINITION, SCOPE AND OPERATION OF TOWN AND COUNTRY PLANNING

1-1. DEFINITION

TOWN AND COUNTRY PLANNING is not an easy subject to define. B. J. Collins, in "Development Plans Explained," calls it "the organising of building and land use in pursuance of an express scheme of urban or rural evolution." This is a clear, workmanlike definition which perhaps falls short of complete accuracy because a plan may, and indeed in some cases must, be prepared without there being any "express scheme of evolution" in existence. More lengthily, Town and Country Planning might be described as the art and science of ordering the use of land and the character and siting of buildings and communication routes so as to secure the maximum practicable degree of economy, convenience and beauty.

The name itself, however, is not altogether satisfactory, although it has so long been used in the titles of Acts of Parliament that it is well established and fairly well understood. B. J. Collins, in his presidential address to the Town Planning Institute, published in its Journal for December, 1957, pleaded for the shorter title, Town Planning, to be generally used, because it indicated the essential core of the subject matter concerned and was generally understood to include rural planning. There may be much in this argument, but there is the objection that rural Planning is already a neglected subject, and to omit reference to it in naming the activity of which it forms a part would be to invite further neglect. Other titles which have been used from time to time are: "Physical Planning", "Land Planning", and "Land Use Planning". The first of these hardly seems precise enough, and the other two both seem to leave out of account the more detailed aspects of planning.

Nearly all development of land is in fact in some sense planned, even if not set out on a drawing board before building operations begin. The trouble is that generally the area over which the planning is done is inadequate, the execution unsatisfactory and the Planning done in insufficient detail. The gradual development of a mediaeval town or of a village may often truly be said to be unplanned, but the rate of growth of these places has normally been so slow that each individual building can be erected as needed with full consideration of its relationship with other development. In conditions of this kind, unplanned growth may result in satisfactory conditions. By contrast, the 19th century industrial revolution town is an example of piecemeal Planning; each individual housing project had perforce to be drawn up beforehand in order that building operations could be organised, but these towns were unplanned in the sense that there was no co-ordination between individual projects and no consideration of the social needs of the inhabitants

or of the eventual overall pattern of the town. The chaotic results are familiar to all of us. Only when all aspects and implications of development are taken into account and allowed for in the form of development eventually carried out over the whole of a community or region can it be said that the whole process of Planning has been carried out.

1-2. SCOPE

Planning has both social and economic aims. Socially, successful Planning tends to make people's lives happier because it results in a physical environment which conduces to health, which allows convenient and safe passage from place to place, which facilitates social intercourse and which has visual attractiveness. The economic results of good Planning also, of course, conduce to increased happiness, but not quite so directly. A proper spatial relationship between the communities in a region and the constituent parts of a town, compactness of development, and an efficient arrangement of communication routes all result in human activities being carried on more efficiently and less wastefully, and thus increase wealth; but the results are not evident so far as they effect the welfare of a particular individual at a particular moment of time. This also applies to Planning provisions designed to conserve valuable woodland, to prevent the exploitation of valuable minerals being impeded or prevented by building taking place on the land above them or to secure that, where agricultural land is put to some other use, the less fertile is taken rather than the more fertile, where other and stronger considerations do not intervene.

For all that, it should be strongly emphasised that Planning, in the sense with which we are concerned with it, deals primarily with land, and is not economic, social, or political Planning, though it may assist greatly in the realisation of the aims of these other kinds of planning, and should obviously be made to fall into step with them. A source of considerable perplexity lies in the fact that Planning, even in the sense in which we are using the word, is likely to vary greatly in the range of its application. For example, in this country Planning powers are not used to regulate the change of use of land from one kind of agricultural use to another, nor to reorganise the regrouping of farm units. They could possibly be so used, but it would require a change of national policy, expressed in legislation, for this to be done, just as such a change would be needed in those countries which do not, unlike Britain, control the appearance of buildings by means of Planning powers.

The kind of Planning which is done is in fact closely limited by political policy and by the form and extent of the legal powers given.

This leads to a variety of problems, which, though they will have to be discussed in detail later on, must be briefly touched upon here. Throughout this book I have assumed parliamentary democracy as the background to Planning. Obviously, under a dictatorship, many Planning problems diminish or disappear. In a country where extreme *laissez faire* is the rule, Planning may hardly be possible in any real sense. In any democracy, however, conscious or unconscious decisions have to be made about the legitimate limits and forms of public intervention in private lives. It is of the utmost

importance that attempts should not be made to secure by means of Planning action social results which, though they may be desirable, are not within the accepted scope of public control.

With certain exceptions, a policy of what might be called "social neutrality" is followed in this country. That is to say, the individual is permitted to do as much as he likes, provided that he does not thereby do injury to the person or property of others in ways which the law has decided shall be illegal or evade the responsibilities, such as payment of income tax and jury service, which the law lays upon him. The border-line between those things in which the state concerns itself and those with which it does not is always shadowy and from time to time moves a little in one direction or the other; these movements, furthermore, are sometimes in advance of public opinion and sometimes lag behind it. Few would now question the desirability of compulsory education, many would dispute the propriety or need for any form of censorship of literature or art. Religious toleration is very wide; citizens are not compelled to attend places of worship and, on the other hand, religious sects are permitted freely to carry on their activities, provided they do not come into conflict with the general law of the land. Furthermore, such changes as take place in the law, so far as it affects the freedom of individual conduct, are for the most part the responsibility of Parliament and have not been the subject of delegation to Local Authorities, which can do nothing they are not expressly authorised by Parliament to do.

It therefore seems clear, at least to me, that Local Authorities are under a duty to discharge their Planning powers in such a way that they do not seek to discriminate between land uses involving activities of which they do not approve and those of which they do approve. To take a simple example, many people would agree that listening to classical music is a more desirable activity than attending greyhound racing, but unless and until Parliament makes greyhound racing illegal, it is the duty of a Planning authority to consider an application for permission to establish a greyhound racing track as carefully and impartially as one to erect a concert hall. It is no doubt true that the effect on its surroundings of the former is likely to be so much wider and greater than of the latter that the number of sites suitable for it may be severely limited. This is a factor which can properly be taken into account in deciding the right use of land; the social desirability cannot.

I would, myself, extend the principle of social neutrality as far as to suggest that "Planning by demand" is the only safe means of ensuring that public control over the use of land is kept within proper bounds and does not encroach upon individual liberty. Restrictions upon economic activity are absolutely unavoidable in contemporary civilisation, and seem to me to be fairly clearly separable from interference with personal liberty. Obviously, any public exercise of Planning powers does involve substantial interference with economic liberty.

A simple exhortation to Plan by demand, to seek to arrange the development of land in such a way that it accords as closely as possible with the wishes of the majority, yet does as little as possible to affront those of minorities, does not really get us very far, for people do not always know what they want. Catherine Bauer has expressed this well in "Social Questions in

Housing and Town Planning.” “Conscious consumer wants are limited by experience and knowledge,” she writes, “by and large, you can only want what you know . . . what we really want to know therefore, is what people would want if they understood the full range of possibilities on the one hand, and all the practical limitations on the other.”

It is of enormous importance for Planning proposals to be based upon as reliable as possible an estimate of these notional wants rather than upon assessment of naïve wants, mere guesswork, or worse, upon the assumption that people should be given what they ought to want. In this connection, it is worth quoting from a paper by Professor T. S. Simey printed in the *Journal of the Town Planning Institute* for May, 1953. He mentions the opinion of a certain sociologist that “it is possible to coax people out of their inturbed phase and on to shared local spaces, as there are fundamental human satisfactions in seeing neighbours and being seen by neighbours.” His comment is: “this implies both that it is desirable that people should be ‘coaxed’ to do what will give them ‘fundamental human satisfaction’ and that the sociologist is well employed in associating himself with the process of judging what these satisfactions are. This is praiseworthy in itself, but it must also be recognised that it is dangerous as it is but a short step from ‘coaxing’ to cajoling, and if the sociologist is to start laying down the law about what is a ‘fundamental human satisfaction’ he is in a fair way to becoming a mastermind himself, and all that is implied by the phrase.” (Earlier in his paper Professor Simey had enlarged upon the dangers of Planning being regarded as a field of operation for “masterminds”).

It may well be argued that it is unlikely that sociological techniques have yet reached the stage of perfection necessary to allow Catherine Bauer’s admirable precept to be followed. It can also be urged that it is a poor set of governors who formulate their policies simply upon the immediate and uninformed wishes of a simple majority of their constituents; that it is indeed the duty of governors to govern, and that in a democracy they can easily be dismissed by the electorate if they fail to give satisfaction. This is true. And it seems necessary to add only that successful leadership depends upon leading without getting too far away from the led.

Not only may the range of Planning activity vary considerably; so may the degree of detail into which it enters. It would be possible to control the broad distribution of uses within a town without seeking to control the location of individual shops, or the detailed layout of a housing estate. It would be possible to control the appearance of buildings without bothering with that of fences and other means of enclosure; with the general location of rural housing without troubling about the siting of individual country houses. It must always be to some extent a matter of political decision what degree of detail of control is exercised; the main determinant will usually be whether the amount of public money spent and the amount of private irritation caused in exercising very detailed control is justified. This is another matter about which I shall have much more to say later on; it is another source of confusion and misunderstanding about which clear thought is necessary.

It has already been explained that no Planning can be carried out without the existence of the necessary legal powers; similarly, no positive Planning,

which generally involves the execution of projects with the help of public money, is possible unless funds are granted by the appropriate authority. Much is said about "the cost of Planning". So far as the control of private development is concerned, the cost is no more than the cost of the staff engaged upon Planning, since this control is concerned with directing to the appropriate places and securing an appropriate form for development which would in any case take place. Any Planning which is being done competently would, in fact, save a great deal of money, if not for the individual, for society, since the shaping of development to secure compactness, accessibility, the appropriate location of various uses and safety must greatly reduce the cost of many human activities.

Public projects, such as the construction of main roads or the building of a town hall or swimming bath, do of course cost a great deal of money, and they may consist of development which, however desirable, is not absolutely indispensable for the life of the community. For the most part, however, they would, sooner or later, have been carried out, even in the absence of specific Planning proposals, though the existence of such proposals may well emphasise the need for them and accelerate their provision. It seems reasonable therefore to consider them from the point of view of cost in much the same way as private development.

It is worth noting here that, of course, nothing will be done to implement Planning proposals unless some person or persons, private or public, is able and willing to carry out the development proposed. Very detailed Planning proposals which include provision for particular buildings on particular sites are therefore quite often almost meaningless because they have taken no account of the improbability of a developer being found to implement them. Conversely, the restrictive aspects of Planning proposals designed to prevent unsuitably located land from being built upon or inappropriate uses intruding in a particular area, depend for their success upon the ability and willingness of Planning Authorities to carry out the day-to-day control of development effectively. Success depends upon the tendering of right advice by Planning officers to their committees, the acceptance of such advice by the committees and, very often, support for those decisions by the Minister on appeal. Some writers on Planning have tended to wave away development control as a rather squalid affair. It is in fact a crucial link in the chain of Planning action. If it breaks, all is lost.

Some people still question the need for Planning, although one would have thought that the consequences of not Planning which lie all around us would provide sufficient answer—the ribbon of dwellings along the by-pass, the traffic jam in nearly every town centre, Peacehaven and many similar anarchic messes.

Planning is needed to prevent intrinsically bad uses of land, such as those just mentioned, but also to prevent the loss of valuable resources, such as woodland, minerals and fertile land, by reason of buildings being erected over them. Such action is needed to combat human folly and greed, but even in a community of saints (in a 20th century industrial society) public Planning action would still be necessary, if not to prevent wrong, at least to co-ordinate the activities of different developing agencies in order to produce a well-

articulated whole. It is inconceivable that a satisfactory totality could be brought about without the operation of some definite and established agency for co-ordination. This, of course, would not necessarily have to be the kind of local authority familiar in this country; it could be an *ad hoc* body or even a private agency, provided that this had control sufficiently comprehensive and over a sufficiently large physical area. To allow the free play of economic forces to determine the location of land uses, may, as already suggested, work well enough in a comparatively primitive community where there is no intense pressure on land, but is hardly possible in the circumstances now envisaged. One fact alone makes this certain. Many uses such as public parks, publicly provided schools, sewage works and the like do not earn profits, and in the absence of public Planning are bound to be outbid by profit-earning uses in respect of sites attractive to the latter, and forced on to sites which nobody regards as potentially highly profitable, which has deplorable results.

This leads directly to consideration of the whole complicated problem of compensation and betterment, which, though it has no direct effect upon Planning technique, has so frequently prevented the implementation of Planning proposals that it cannot be ignored as a factor in the operation of Planning. The following discussion is confined to the bare essentials of the problem.

1.3. COMPENSATION AND BETTERMENT

The value of a particular piece of land may be regarded as divisible into two parts; its value for the purpose to which it is already being put, and additional value, often called development value, attributable to the likelihood of its being able to be put to some more profitable use. The most familiar example of this is land which as agricultural land may be worth no more than £100 an acre, but which because of the likelihood that it can be used profitably for building purposes, either immediately, or in the fairly near future, may fetch £1,500 an acre. In this case, its existing use value is £100 per acre, its development value £1,400 per acre.

Planning involves the restriction of use of some land so that its development value cannot be realised, and Planning projects involve the acquisition of privately owned land by the public. There has been an assumption in most times and places that in such circumstances the landowner who suffers loss should be compensated therefor, but from this simple and equitable principle many complications flow.

In the first place, if, as was the case in this country up to 1947, and is so still in many other countries, compensation has to be borne by the particular local authority in whose area lies the land to which restrictions or compulsory acquisition is being applied, it may often be that the areas in which the most stringent planning restrictions are needed, and hence the heaviest burden of compensation occurs, are those where the local authority has least resources to meet the burden, and that the restrictions imposed by no means only benefit local inhabitants but have regional or even national effects. The preservation of green belts around metropolitan areas is an obvious example of this. The remedy for this problem is a simple one. It is to make the

burden of planning compensation a national one, and this was provided for in this country in the Town and Country Planning Acts of both 1947 and 1954.

There are complications less easy to deal with. Not only may public action deprive an owner of land or diminish its value to him, but it may also increase the value. The building of a railway, a main road, or a sewer, the provision of a water main, a school or a public park or the removal of detrimental industry are all examples of public actions which are likely to increase the value of land over a greater or lesser adjoining area. If, later, such land needs to be publicly acquired, it seems clear that there is no reason why the public should pay an enhanced price resulting from an increase in the value of the land brought about by public action and in no way due to the efforts of the owner, nor does there seem any reason why compensation for restriction on use should be greater because the development value attaching to the land has been increased by such action. Some would go further and say that when neither compensation for restrictions nor compulsory purchase arise, a levy should be made on the land to enable the public to reap a part at least of the increased land values it has brought about. Such direct levies have been visualised from time to time in legislation, for example in the earlier Planning Acts in this country, including the Town and Country Planning Act of 1932. They have not usually been very successful.

The extent to which such increases or "betterment" ought to be collected by the public is principally a political and financial one; the interest of the Planner is to be able to operate in conditions which enable land to be put to its most suitable use in the public interest without having constantly to consider whether any particular proposals are likely to involve a burden of compensation so crippling that they are unlikely to be implemented for that reason. It is therefore important in this connection to realise that unless some carefully arranged scheme for compensation is devised there is a strong probability that within a given area the total amount paid for compensation will in fact substantially exceed the total loss suffered by the owners compensated.

Consider the town shown in Fig. 1(i). Within the surrounding cliffs it is assumed that all the land is about equally suitable for development and that the area concerned is sufficiently small for all the land within it to possess an appreciable development value. This is merely a convenient simplification of the situation more generally found where the development value of land gradually decreases as distance from the built-up centre increases, until it becomes negligible, which introduces further complications with which we need not here be concerned.

We have to imagine an energetic and enterprising local authority operating without the benefit of any scheme for coping with the problems of compensation and betterment. Each time the local authority acquires a piece of land it has to pay the full market value, including development value. Each piece of land so acquired reduces the supply of land available for private development, without reducing the demand, since aerodromes, sewage disposal works and cemeteries do nothing to satisfy the demand for land for houses and factories. The market price of land available for development can be expected to rise a little each time the supply is diminished, and eventually the

local authority will be paying for land a price quite substantially enhanced by their own laudable efforts in improving the town's facilities.

In the case of a town with more normal topography there will be more land physically suitable for development than is likely to be needed for such purposes, and it may be impossible to forecast with any accuracy which particular pieces of land from the choice available will in fact be selected by intending developers. But landowners, when making claims for compensation will, naturally enough, urge the strong probability that their particular holdings would have been among the land selected for development but for the intervention of Planning restrictions, and will claim correspondingly high losses. It may be very difficult indeed for the authority concerned successfully to contest such arguments.

This was the thesis put forward in the report of the Expert Committee on Compensation and Betterment, known generally as the "Uthwatt Report", in paragraph 23 of which it was suggested that the total amount of land for which claims for compensation could be made good might well be of the order of four times as much as the land actually likely to be required for development sufficiently soon for it to have an appreciable present value for development purposes. This conclusion has been challenged in some quarters. It has been said that in fact intending developers or land speculators when making bids for the purchase of land take into account the chances that it may never be possible to develop the land profitably. However this may be, it does seem clear that there is bound to be a strong tendency for the over-valuation of compensation in such circumstances, even though it may not reach the proportions assumed by the Uthwatt Committee.

The scheme for the solution of all these problems embodied in the financial provisions of the Town and Country Planning Act, 1947 was in principle simple but was rendered complex by numerous savings, exceptions and modifications. In essence the Act nationalised development value but left existing use value with the owner of land. As compensation for the loss of development value, a sum of £300,000,000 was allocated to meet all claims for loss. There was thus no guarantee that claims other than those by owners of "dead ripe" land and other preferential claims would be met in full, but as it turned out, had the scheme not been repealed, non-preferential claims would have received about 16/- in the £.

The £300,000,000 was to be paid out *in toto* by the 1st July, 1953. Since, under the scheme, landowners were to be compensated for the loss of development value out of the fund, there was normally no payment of compensation to be made for refusal of Planning permission. On the other hand, when Planning permission was given, except for very minor development, the intending developer had to buy back the development value for the loss of which he was to be compensated out of the £300,000,000. This payment was known as a "development charge". The intention of the Act was that where land was developed by someone other than the owner entitled to compensation, the developer would pay the owner existing use value only and would pay the development value to the State in the form of development charge. Fig. 1 (ii) indicates the way in which payments and receipts relating to transactions in land were intended to be made.

Unfortunately, it was not made illegal to sell land at more than its existing use value, and the sanctions against doing so were slight and scantily used. In the exceptional conditions of the post-war years landowners were often able to sell land at its full market price, so that the purchaser, who also had to pay development charge, was paying for the development value of the land

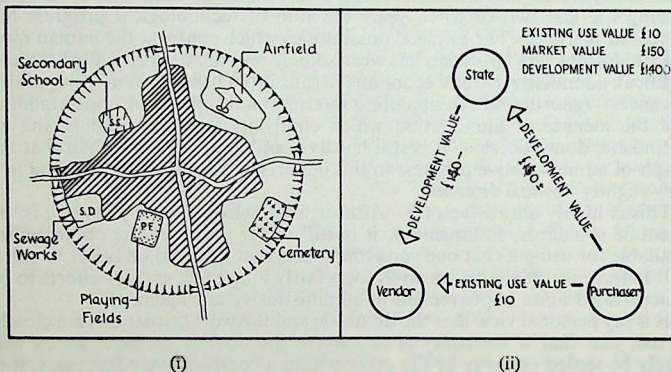


FIG. 1 (i) Successive public acquisitions in a town with limited room for growth diminish the supply of land for houses and other building uses without reducing the demand for it, and hence the price of land rises with each acquisition.

(ii) The assumptions upon which the financial provisions of the Town and Country Planning Act, 1947 were based. Upon the sale of a piece of land for development the transactions shown above were supposed to take place, leaving all parties in the same financial position as they would have been but for the passing of the Act, but making the payment of compensation a national charge, and so enabling Planning to be carried out without concern for the values of particular areas of land.

twice over. It was possible for a landowner to exploit the situation in this way, because, to take the commonest example, the restrictions on prices of new houses were such that while a new house might sell at £1,600, its close pre-war equivalent, on the selling price of which there was no restriction, might fetch £3,000 or more. In these circumstances, the fortunate possessor of a building licence did not worry too much whether he had to pay £10 for the plot of land on which the house was built, which might well be its existing use value, or £150 which might be its full value, including development value. When he realised what had happened and had to pay another £140 in development charge he was likely to grumble, but his grumbling was more often directed at the Government, who imposed what he regarded as a tax, than at the previous owner of the land. This was one of the more potent causes (another was what often seemed to be unimaginatively excessive assessment of development charge, which lent colour to the "tax" theory) which turned

public opinion against the 1947 Act scheme and led to the substitution for it of the scheme contained in the Acts of 1953 and 1954.

This is less radical and less simple. Development charge is abolished, as is the once-and-for-all-payment of the £300,000,000 fund. Compensation both for Planning restrictions and compulsory acquisition becomes payable when loss is suffered, and not before, and is limited to any admitted claim on the £300,000,000 fund, plus $\frac{1}{7}$ accrued interest, to which, in the case of compulsory acquisition, existing use value is of course added. Furthermore, compensation is not payable for what has been called "good neighbour" restrictions, nor for restriction of development to one profitable use rather than another. If the erection of shops is refused but houses would be permitted, then no compensation is payable, for example. In general, in fact, compensation is only payable where the development of land is prevented rather than restricted, and since compensation is restricted to land in respect of which there was an admitted claim under the 1947 Act, no compensation is payable for prevention of building on land so remote from existing development that no claim for loss of development value could have been substantiated in 1947. Compensation for compulsory purchase is limited in the same way.

Where land is sold privately there is no limitation, direct or indirect, imposed by the Act on the price charged, which leaves the vendor free to reap the full market value of the land. This is the principal difference between the 1947 and 1954 schemes. The former, by means of the development charge, (which could be raised above 1947 development value where an increase had occurred meanwhile) reaped for the public all increases in land values since 1947; the latter does so only where Planning restrictions or public acquisition are involved.

On the other hand the 1947 scheme provided for compensation in *all* cases where an owner was prevented from reaping development value; the 1954 scheme only compensates him for restrictions more onerous than those of the "good neighbour" type.

The merits of the 1954 scheme are that no very large payment, with possible inflationary effects, is made at any one time; payment for loss is only made when loss is actually suffered, and there is, as noted, no compensation for restrictions designed to secure reasonable disposition of land uses in relation to each other. The 1947 Act scheme did not possess any of these advantages.

The disadvantages of the 1954 scheme, though less definite, are however probably more serious. In the first place, it becomes financially disadvantageous for a landowner to be refused permission or to have his land purchased for public purposes. Under the 1947 Act it made no difference to him unless he went in for the kind of exploitation mentioned above, and it is very likely that the easing of housing shortages would have made it no longer possible to do this within a few years. Since a landowner is now financially aggrieved by planning restrictions and compulsory purchase it is all too possible that Planning policy may in particular cases be distorted by sympathy for individuals, which is the very thing that any comprehensive scheme of compensation and betterment ought to avoid.

It seems, too, a bad principle that where permission for development is

refused, or development is undertaken by public bodies, the betterment which has accrued since 1947 should be taken by the public, but that where private development takes place, the public reaps no betterment. Surely all should forfeit betterment, or all should reap it.

There is the additional danger, though fortunately at present there is no sign of it, that, apart from sympathy with individual landowners, Government pressure may be brought to bear on local planning authorities to abstain from Planning decisions likely to result in very heavy payment of compensation, particularly where the Planning benefits of such refusals are not particularly obvious.

Probably the most serious effect of the 1954 Act is one which does not affect the Planning profession, namely, all the complicated "unscrambling" devices for the paying back of development charges already paid under the 1947 Act, and the straightening out of the numerous special financial arrangements made between vendors and purchasers for the transfer or retention of claims on the £300,000,000 fund.

Despite the criticisms made above, there is no doubt that we still have a very useful system which, at present at least, leaves local planning authorities free to allocate land to the purpose for which it is best suited, though as it is at present administered, with very inadequate opportunities to acquire land for public purposes.

There can be no certainty about the effect which the Town and Country Planning Bill, 1958 will have when it becomes law. This measure seeks, broadly, to give the same privileges to landowners whose land is compulsorily acquired as the 1954 Act gave to those who obtained Planning permission. They are to receive compensation based on the full market value of the land instead of being limited to 1947 Act claims as a basis.

This leaves owners who are refused Planning permission in a disadvantageous financial position as compared both with those who obtain permission to develop and with those whose land is acquired for public purposes, and it seems that they will have a logically unanswerable case to press for further legislation to place them on the same footing.

If this happens the whole structure of the great 1947 Act scheme will have been dismantled and the attempt to rationalise the compensation-betterment problem abandoned.

This cost to the nation is bound to be very great, either because of the increased cost of Planning restrictions and public acquisition, or, which would be very much worse, because the cost is considered to be too great, and full and effective Planning control no longer attempted.

1.4. FUTURE OPPORTUNITIES

One of the greatest difficulties in deciding Planning policy is to distinguish between the physically and economically practicable and the psychologically, legally, and administratively practicable. There are many aspects of Planning which do not involve any great technical difficulty, but which nevertheless do not get carried out, simply because it is impossible to secure agreement, or even sufficient initiative, on the part of the agencies concerned. There is a great difference between the technical problems of how to apply human

effort in the field of land development in the best way and that of securing administrative and economic organisation of a kind which allows the effort to be made.

Since the enormous development of technology of all kinds during the war it has been apparent that we were standing on the brink of a new technological revolution, which would in turn bring about a second industrial revolution. During the last two or three years the rate of technological progress has increased sharply. The physical possibilities which confront the human race, are, as almost every politician has wearisomely reiterated, practically limitless. Political, administrative and economic organisation has shown no comparable advance. Ignoring all the appalling international failures of understanding and the menace of annihilation which confronts mankind, and taking an optimistic, domestic view, it is still hardly possible to say more than that the graph of administrative progress in this country is a straight line inclined in a very slightly upward direction.

This is highly unsatisfactory. Although knowledge about Planning is, by scientific standards, rudimentary, it is still so far ahead of the opportunities available for using it that one sometimes feels that it would be better to call a halt to technical Planning research for a fairly long time, and for efforts to be concentrated upon improvement in administrative arrangements.

It is my personal view that the domestic and the world situations are closely linked, and that if humanity is to survive the nuclear menace, which will surely be settled one way or the other within a comparatively few years, it is likely to survive it gloriously and to proceed to a fulfilment of technological possibilities greater than it is easily possible to imagine. It seems certain that if this comes about it must inevitably be accompanied by an enormously rapid advance in social organisation to enable technological resources to be adequately deployed.

This involves something of fundamental importance to Planning thought and Planning method. A great deal of the material in this book deals with policies which are unattainable at the present level of organisation. This is particularly so in the field of Regional Planning. Although a good deal of the reorganisation involved in pursuing such policies is also at the time of writing physically unattainable except over a very long period, the full application of technological ingenuity and inventiveness to building and road construction, combined with a reorganisation of political and administrative processes designed to secure full play for the former, could easily increase both the scope and speed of physical reconstruction to a prodigious extent.

If we were able to increase the productivity of building labour by, say, ten times and also to secure the land needed for comprehensively planned development and redevelopment immediately and without considerations of price intervening, the remotely impracticable would become the immediately practicable in many cases.

We should be able to Plan with the needs of true economy uppermost. We should be employing the inventions of technology and the ingenuity of designers within a proper framework instead of within a cramped and twisted framework imposed by prejudice and defective economics.

Three examples may serve to illustrate this enormously important principle.

The design for the new Barbican by Sergei Kadleigh and his associates was a triumph of technological ingenuity and skilful design, yet, to my mind at least, it had a ghastly futility. It was an extraordinarily complicated design based on the assumption that neither metropolitan decentralisation on a scale sufficient to solve the work-home relationship nor the breakdown of fictitiously inflated land values is possible, and that the only way to give homes to workers in the City of London close to their work is to build a vast fairy castle, with storage below ground level, high rent earning commercial and industrial uses at and near ground level and tall blocks of apartments for residents stretching high above, denied contact with the earth. Incidentally it seems unlikely that this solution would have been feasible in relation to the traffic problems created by it. It is, in my view, a monstrosity which implies that, while there may be no limits to human constructional ingenuity, the limits of social organisation in relation to land use are desperately narrow.

The great urban motorways of the United States, and to a lesser extent of other countries, have earned a great deal of praise. Here again, the ingenuity employed is, to my mind, misdirected. It is fundamental that, in terms of human effort, it is much more costly to burrow or to bridge than to remain at ground level. The disparity is of the order of ten to fifteen times as much effort required to change level as to stay at ground level. Broadly, it would be my contention that, except in very exceptional circumstances, the need to burrow or bridge in relation to urban highways is evidence of a failure to secure a proper distribution of land uses. American speakers at the conference on urban motorways held in 1955 in London seemed to ignore this. Immersed in the technical marvels of their works they tended to wave away suggestions that it would be better to seek the means of avoiding the necessity for such roads as impracticable dreaming.

The sun shines directly upon the earth, and, if its rays are not intercepted by physical structures or a heavily polluted atmosphere, it gives sufficient light, unaugmented, for most human activities to be carried on between sunrise and sunset. Daylighting standards have been devised to ensure that buildings are erected so that enough light enters them for all necessary activities to be carried on without recourse to artificial light by day. However, it has sometimes been suggested that these daylighting standards are unjustified; that it is better to build much more closely than they allow upon valuable land in city centres, thus securing higher returns upon capital expended, and to rely to a considerable extent upon electric light for illumination.

This is really a splendid example of the "practical man's" lack of practical sense. In order to have electric light the sun still has to shine; as a result of its shining a number of things happen: plants grow, die, decay, become coal, are dug out again, fed into furnaces which convert water into steam, which turns turbines, which produce electric current, which can be turned into electric light. (There are other ways of producing it, of course, but they all involve a chain similar to the above.) It is in a real sense utterly uneconomical to expend human energy upon all these processes when the same result can be secured simply by building buildings far enough apart to let the daylight in.

I should not like to be thought to assume too extreme a position on this matter. Whatever technical advances may lie on the threshold, it will still obviously be necessary for many years to ameliorate conditions in existing towns by inherently uneconomical methods—by tunnelling and bridging, certainly, if not by building too closely. What I am concerned to express, and to express as strongly as possible, is that Planning should be concerned to promote true economy rather than to subserve the misapplied ingenuity employed in creating unnecessarily complicated and costly structures justified only if it is assumed that sane land economics are incapable of attainment.

Unless the problems of technology, the enormously increased standard of living which technological advance can provide and the use of land are looked at together in proper perspective there is the gravest danger of falling into a ridiculous situation. Human space needs, particularly with reference to the human dwelling, fundamentally depend upon the dimensions of the human body, which can hardly be affected by technological processes. It would be profoundly ridiculous if, because of a supposed requirement to concentrate urban land use, the space standards of dwellings were progressively decreased in the interests of greater production, for surely one of the greatest benefits which could be conferred by a higher standard of living would be to secure for the mass of people liberal space provision.

Already we have seen how government policy, as exemplified in the booklets, "Houses 1952" and "Houses 1953," has cut down dwelling standards by urging the provision of smaller houses at a higher density. This is a false aim, and should be recognised as such, particularly since there is no trace of real evidence to suggest that such reduction of standards is necessary. A full discussion of the considerations which should govern the establishment of a standard of dwelling density is contained in Chapter 16.

CHAPTER 2

THE CONTINUITY OF THE PLANNING PROCESS AND THE PLANNER'S SKILLS

2-1. CONTINUITY

THERE MIGHT POSSIBLY be Planning, in our sense of the word, of sub-continental regions as a whole, or of countries. As yet Planning has hardly been applied in a full sense to any larger unit than the county. But in order to illustrate the thesis that follows, that of the continuity of Planning from the broadest process to the most detailed, it is necessary at least to suggest what might be applied in national Planning if it were undertaken.

Although we have no national Plan as such in this country, embodied in a coherent series of maps, diagrams and written statements, there is a somewhat shadowy national Planning policy of which plans for trunk road improvements, policy on the distribution of industry and adumbrations of policy on such matters as density and the relief of metropolitan congestion form parts. It is at least arguable that it would be beneficial to collate these into a single set of documents comprising an outline national land use Plan, if only because doing this would suggest the need for further development of policy and might easily reveal discrepancies between the aims of the different ministries primarily responsible for various aspects.

It is important to stress here that at this very general level the contribution of the Planner, in our sense, would necessarily be somewhat limited. Many of the decisions to be incorporated in such a Plan would have to be made primarily on the advice of economists and geographers, and would be based on economic considerations far removed from land use, the determination of which would be the last link in a fairly long chain.

At this stage the role of the Planner might well be limited to the collation of information and its expression in graphic form, and to tendering advice upon the land use implications, favourable and unfavourable, of various alternative policies relating to the distribution of industry, the arrangement of the national transport network, the exploitation of natural resources and the location of power generators and reservoirs.

At the regional Planning level the Planner comes into his own to a much greater extent. Regional Planning, sensibly defined, involves proposals for the distribution of population and industry, the location of main transport routes, the distribution of rural services and the location of large non-agricultural uses in open country to a greater degree of detail than would be comprehended in a national Plan. These proposals should fit in with the requirements of such a Plan, but still be confined to very broad decisions as to quantities and locations rather than the choice of particular sites for particular uses.

It is reasonable to suggest that much of this work falls within the province of the economic geographer, but that considerable knowledge of town Planning technique is also necessary in order to avoid, for example, the selection of communities for considerable expansion which are not in fact capable of absorbing such expansion satisfactorily. It is here the Planner's synoptic function, his ability to weigh, and discover a satisfactory resultant of, the physical, economic and social factors involved, comes into play.

Here then is the first clear indication of that strong connection between the various stages of the Planning process which I believe to be fundamental to any real understanding of Planning as an art and a science. The essence of this is that at any given stage in the Planning process, except at the first and the last, it is necessary not only to look at the particular job in hand but to look back to the requirements imposed by some more comprehensive Plan covering a larger area, to interpret these requirements intelligently for the immediate task and also to look forward to the next stage in the Planning process, the next more detailed stage, so that the proposals currently being drawn up shall be so arranged as to allow detail to be filled in satisfactorily.

This process of looking simultaneously backwards and forwards is perhaps most fully exemplified at the next stage, of which the most typical instance is the preparation of a town Plan. At this stage a new factor has to be taken into consideration; the need for remedial measures to heal the town's sickness, whether of congestion, maldistribution of land uses, defective road system, or all three. In preparing the Plan it is necessary to ensure not only that appropriate amounts of land are allocated to residential and ancillary uses and industry to fit in with proposals in the regional Plan for the distribution of population and industry, and to rectify congestion and shortages in existing allocations, but to ensure that the shapes and locations of these areas are such that, at the next more detailed stage, a good example of which is the neighbourhood plan at a scale of perhaps 1/2500, a well arranged road skeleton and a satisfactorily related system of minor service centres and open spaces can be designed. It is seldom practicable at the stage of preparing the town Plan to do all the detailed work involved in preparing neighbourhood Plans and to generalise these back as it were, into a town Plan, although it would no doubt ideally be desirable to do this. This I have found is a point of particular difficulty to students, who often find themselves at sea when asked to produce a town Plan without being given time to work out fully detailed designs for its various parts.

The neighbourhood Plan and others belonging to the same stage—the village Plan and the town centre and industrial area Plans—having been prepared, the final stage in the Planning process is the actual location and design of individual buildings and groups of buildings, and the provision of minor roads to serve them. It is a matter of argument at what precise point the proper boundary between Planning and architecture, landscape architecture and civil engineering should be drawn, but it is obvious that the more detailed the proposals being considered the more predominant become the roles of these specialisms.

Another aspect of this detailed stage of the process is of course the application of development control to problems involving the use of land which are

more detailed than can be dealt with in a development Plan of even the most detailed kind.

Most people would probably agree that it is reasonable to give predominance to the economist and geographer at the most general Planning level and to the architect and other specialists at the most detailed level, but there is far from general agreement about what seems to me an equally obvious fact, namely the need at the intermediate levels, particularly at the town Plan level, for the predominance of the town Planner. The work involved at this stage is not comprehended to any appreciable extent by any of the specialists mentioned, being something entirely different in kind and not merely in degree. One sometimes hears of a town Plan having an "architectural" quality or being an "engineers' plan". Rightly regarded, such Plans, it seems to me, merely give evidence of the insufficient scope or balance of their author's knowledge and experience.

2.2. SKILLS

The qualifications necessary for those engaged in the practice of Town and Country Planning have long been a matter of controversy. In the earliest days of Planning in this country the men engaged in it were of two main types: first, those who had no special technical knowledge but a great interest in the subject, derived usually from a zeal for social reform, and, second, technical men, such as architects, engineers and surveyors, whose interest sprang mainly from their professional activities. As time went on, Planning began gradually to be recognised as a semi-independent profession. The Town Planning Institute was formed, and qualifying examinations for Corporate Membership were devised, but, partly because of the origins of the profession, partly because of the uncertain economic future of those engaged whole-time in it, until very recently the great majority of Planners have also been either architects, civil or municipal engineers or chartered surveyors. This tendency has been strengthened by the fact that the examinations of the Town Planning Institute are conducted by a Joint Board with members drawn from three of the above professions. (Civil engineers *per se* are not represented).

Up to the late war, no one could be quite sure that the Planning profession was viable; there seemed to be a distinct chance that the vagaries of economic or political fortune might blow it into oblivion. Young men, therefore, even though they might decide at a very early stage in their careers that they wanted to be Planners, usually took the examinations of one of the so-called basic professions of architecture, engineering or surveying before proceeding to qualify for Corporate Membership of the Town Planning Institute by taking the Joint Board Final Examination, a procedure which not only provided them with an alternate means of earning a livelihood if Planning failed them, but also exempted them from the Intermediate Examination of the Town Planning Institute. This precautionary measure has, in some quarters, been elevated into a principle, and plenty of architects, surveyors and engineers are to be found who roundly declare that the only appropriate entry into Planning is by practice and qualification in their own particular profession.

However, in the late thirties an increasing number of people were appearing on the scene who had not taken the conventional line but who, braving the possible economic consequences, had decided to be Planners first, last and all the time, and had proceeded to Corporate Membership of the Town Planning Institute via its Intermediate Examination. Some of these, who had risen from the ranks of draughtsmen and clerks, were able to take advantage of the exemption from the Intermediate Examination given until recently to those over 35 years of age and possessing practical planning experience. Their practical training had usually been in a local authority office or with a planning consultant, or both.

Preparation for Planning examinations was varied. Many, probably the majority, studied by means of correspondence courses, and found that these, reinforced by office experience, enabled them to meet the then somewhat less stringent requirements of the Institute and Joint Board examinations. Others took the Diploma Courses, giving exemption from the Joint Board examination, offered by Universities and other bodies (but few of these were open to candidates who had not already qualified in a basic profession), while a few relied on their own undirected reading.

Since the war the Universities of Durham and Manchester have instituted five-year Honours Degree courses in Planning, which claim to provide a comprehensive undergraduate education for the Planner, and which give graduates a qualification of higher status than a diploma, which was the only one previously available to those who wished to concentrate on Planning from the start.

The claims of graduates in geography, economics and some other subjects to be entitled to take the shorter post-graduate courses available to members of the basic professions and to be exempt from the Intermediate Examination of the Town Planning Institute have now been met, while increasing numbers of students without a degree or a qualification in one of the basic professions take the Intermediate Examination and then proceed to a part-time Diploma course. Their numbers seem likely to increase, since passing the Joint Board Examination by correspondence course or independent study is, since the adoption in 1950 of a new syllabus, extremely arduous.

Yet others take part-time preliminary and certificate courses at a recognised school, success in which secures entry to a Diploma course.

The increased importance of Town and Country Planning led to the appointment in May, 1948, of a Committee under the Chairmanship of Sir George Schuster, with the following terms of reference: "To take account of the present and prospective scope of Town and Country Planning and to consider and report what qualifications are necessary or desirable for persons engaged in it and to make any recommendations affecting those persons which appear to the Committee to be relevant." The Committee's report was presented in September, 1950. Its recommendations are somewhat diffuse, and thus not easy to summarise. The Committee considered that Town and Country Planning included two principal activities, synthesis and design, and that the second was subsidiary to the first. It defined "design" as "setting out on a drawing board a pattern of physical features", and contrasted this with "the creation of a synthesis" (although, in fact, the creation of such a

synthesis would appear to differ from other kinds of design only in the magnitude of its subject-matter, while design, even as defined by the Committee, certainly includes synthesis). Nevertheless, the Committee appeared to think that this synthesis was more of an administrative than a design process, and went so far as to express the view that a chief planning officer need not be skilled in design, but must merely be capable of appreciating good design.

The Committee did not come down heavily in favour of any particular method of training for the Planner, except to express a strong preference for Planners to have received a University education. It held the view that Planning should be undertaken as a post-graduate rather than an undergraduate study, though it noted the full-time undergraduate courses begun by Durham and Manchester with benevolent if cautious neutrality. It did not exclude qualification in one of the so-called basic professions, particularly if taken as a University study, as a preliminary to post-graduate Planning study, but, equally, did not express preference for them or for any one of them compared with any other course of study.

The Committee cast a somewhat distasteful eye upon preparation for qualification by means of correspondence courses, but evidently recognised that the present geographical distribution of Planning schools makes it certain that they will provide the training for a fair number of potential Planners for many years to come. The principal effect of the Schuster Report has been to make entry into the Planning profession easier for Geographers and Economists.

Let us now turn to an impartial consideration of the subjects a knowledge of which is necessary for a competent Planner. It has often been said that the complete Planner requires a knowledge of so many subjects that it is quite impossible for any one person to compass them all, but I do not believe that it is impossible at least to approach within striking distance of such an ideal. Even less do I accept the notion sometimes heard that the comprehensive training of a Planner as such is futile, and that, *faute de mieux*, initial training and experience in one of the basic professions, giving a thorough grounding in one of the subjects related to Planning, is the best course to pursue, with subsequent specialisation in Planning.

It is not often possible in the course of general professional conversation with a Planner of experience and standing to tell from which, if any, of the basic professions he has sprung. He has become a Planner, indistinguishable as regards the content of his knowledge from others of comparable experience in the profession, whatever their origins, and this has not usually occurred through assimilation of a carefully prepared course of instruction, but in the course of his day-to-day duties, from which he has acquired a working knowledge of the skills most directly relevant to the work of the Planner; most of these skills will be quite outside the scope of his basic qualification. If, as I contend, so rough and ready, casual and unorganised a method of acquiring a large body of diversified knowledge has proved reasonably successful it seems likely that carefully organised courses of instruction directed to the same end and supplemented by similar experience ought to give even better results.

Certainly, study and practice as an architect, surveyor or engineer will

teach a man a great deal which it is useful for him, as a Planner, to know, but it will also teach him even more which is of no discernible use at all for such purposes, and the time spent in acquiring it could have been much better spent in learning about Planning. For example, a junior assistant with a firm of chartered surveyors may learn much about housing, social conditions and building construction which will help in his Planning work from the time he spends collecting rents and carrying out surveys of dilapidations, but it seems almost certain that the useful knowledge thus acquired could better have been compressed into a much smaller space of time and some of the remainder at least spent in acquiring, for example, an appreciation of the visual qualities of buildings, which is indispensable to the Planner, and seldom learnt through the work of a chartered surveyor. One could readily give similar examples in the case of the other basic professions.

The emphasis of what may be termed the basic profession school of thought seems to be on the need for the Planner to have acquired practical experience and practical, rather than theoretical, knowledge, and this school might well reply to the previous sentence that it is impossible to avoid administering a good deal of chaff with the grain. But in preliminary training for Planning the grain should bear a higher proportion to the chaff than is actually the case.

As regards the acquisition of practical knowledge and experience it is common to find among the basic profession school a startling ignorance of what actually goes on in a local planning authority's office (members of the basic profession school frequently being people with views on Planning, but no Planning experience). They appear to be under the impression that the staff of a local planning authority office sits remote in ivory towers creating dream-like visions of the city of tomorrow without regard to practical considerations of cost, time and administrative practicability. Such is, in fact, far from the case. There may still be some ivory tower Planners (with long hair) but not many of them are to be found in the ranks of local government officers, whose difficulty is rather that they are so frequently and harshly confronted by practical difficulties that the ability to prepare bold and comprehensive planning designs tends to be extinguished. In fact, the man in the Planning office is continually bumping up against the practical consequences of his proposals. Let him formulate something which is in the least out of the run of the prospective developer's conventional ideas and he will have to fight a hard battle to get it accepted; any conditions imposed upon a Planning permission which might lead to the least hardship for the developer will be bitterly opposed, every refusal of permission recommended must be on grounds sound enough not only to satisfy members of the local Planning Authority but to stand up to cross-examination at an appeal. Local authority Planners quickly learn to temper idealism with practicability and, as has been suggested, often learn the lesson all too thoroughly.

But the main weakness in the basic profession case is that it assumes Planning to be a specialisation, something related to but narrower than each of the basic professions. This is almost self-evidently not so, as witness the "jack of all trades and master of none" accusation often directed at Planners, which at least recognises the wide scope of the subject, even if its deductions are erroneous. In fact, the scope of Planning is a great deal wider than

architecture, engineering or surveying, and none of the three can cast light upon more than a very small part of the Planning field; it is they which are the specialisms. Since almost every educational course proceeds from the general to the more specific, it is difficult to think that in the case of Planning the opposite is desirable.

In a numerically small profession such as Planning, where, also, the attention moves frequently, being focused sometimes on regional, sometimes on town and sometimes on detailed Plans, it does not, either, seem feasible to train more than one kind of Planner initially. If this is so most Planners must necessarily start off as general practitioners, and this is the more acceptable since, on economic grounds alone, the young Planner is likely to need to change his jobs fairly frequently at first, and each job may require knowledge of a somewhat different aspect of Planning.

Naturally enough there are specialists within the Planning profession, some whose chief interest and strength lie in the architectural aspects of Planning, some in the geographical, some in the sociological, but this does not invalidate the principle of the identity of basic knowledge required. There is a need perhaps for training to be made available for those specialists who intend to work primarily on their specialism but whose contact with the Planning field is such that in order to operate with full effectiveness they require some substantial knowledge of Planning, without needing to devote all the time and trouble required to secure a full Planning qualification. On the whole little has been done to provide such training, though the creation by the Royal Institution of Chartered Surveyors of a Town and Country Planning Division with appropriate examinations is an experiment which may lead to the establishment of one such group of specialists.

Planning is concerned with land; all information concerning land, its shape, fertility, appearance and value, is of direct interest to the Planner. This includes geographical, economic and visual matters, and these are the three main divisions which appear and re-appear in all the subjects involved, with the addition of a fourth, the social aspect, which is mingled with, but distinguishable from, the economic aspect. Sir William Holford, in his Inaugural Lecture, delivered at University College, London in 1948, says . . . " we want people with a broad cultural background, able to understand the point of view of scientist and humanist, and interested in society at all levels. That is easy to say, and it is too general a statement to be of much value. Suppose we break up this cultural activity, prismatically, into its components. From left to right there will be a succession of columns or activities, each fusing imperceptibly into its neighbour, but each distinguished as a separate colour in the spectrum. Out of the whole spread or range of activities let us take two as representing the subject we are discussing—town and country planning. I will call one column Administration and the other Technical Planning and Design. Their boundaries touch, and at the margin it takes a spectroscope to measure where one ends and the other begins; yet in the centre of their columns they are distinctive and different. To the right of the administration column are activities of a colour still further removed from design. They include other types of administration and management, economic planning, political science, government and law.

"To the left of the technical planning columns are the scientific and research activities—and architecture and civil engineering—a long list ranging through the applied and natural sciences and specialist technologies. They include statistical method, social survey, demography, many branches of geography and surveying (including photogrammetry), economic theory, agriculture and agricultural biology, horticulture, forestry, hygiene, building construction and traffic engineering.

"These four columns represent the essential and the contributory elements of town and country planning."

This illustrates extraordinarily well the relationship between the various activities connected with the Planning process. A slightly different way of looking at the matter is given in Fig. 2 (i), which shows the relation of Planning as the Central subject to all the allied activities which contribute to it and to some of which it, in turn contributes and in Fig. 2 (ii) which distinguishes between those huge subjects, such as sociology, economics and geography,

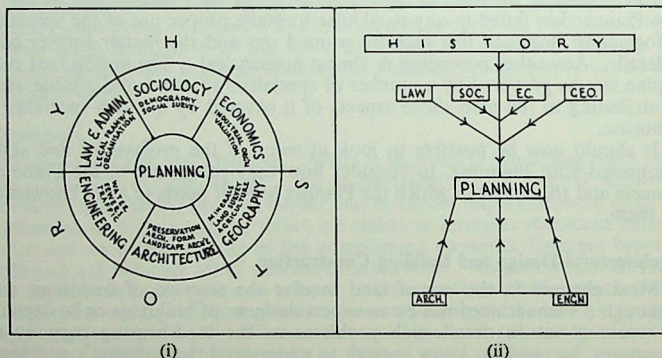


FIG. 2. Planning considered (i) as the centre of a field of study, showing the contributions which various other subjects make to it and (ii) in relation to other Arts and Sciences, showing the contributions made by and to Planning.

even bigger in their scope than Planning, from which relatively small parts can be taken for use in the service of Planning, and those narrower specialisms such as architecture and civil engineering, which are exercised within the general framework of Planning, the limitations and requirements of which need to be studied and allowed for in framing Planning proposals.

Before going on to discuss the contribution to Planning knowledge made by various specialisms it will be well to examine and dispose of a concept which has been much misused. This is the idea of the Planning team, and is often used to pour oil on troubled waters when the claims of some particular specialism to dominance in the Planning field are being argued. Some liberal minded person usually winds up the discussion by saying "after all, Planning is a team job." So it is, but not in the sense in which the term is

generally employed in this context. Let us take as an example the preparation of a town plan; the drawing up of proposals for the rectification, improvement and extension of an existing town. Information about a large number of matters will be needed which can only be obtained by relying on the skilled investigations of specialists who, if they work together well, may reasonably be called a team; but the assembly, comparison, and final evaluation of all the correlations, opportunities and conflicts revealed by these investigations can only be done with full expectation of success by those whose principal experience and knowledge lie in Town Planning. The plan produced is bound to be, if it is worth anything, the product of one mind—of the senior Planner with the task of preparing the Town Plan. He may well delegate to his juniors the working out of the details of his broad conception, and the exploration of possible alternatives, but none of the specialists, *qua* specialists, engaged on the production of information will be equipped to do this. *Their* further role after the draft plan is produced, is to criticise it constructively in the light of the requirements of their specialisms, so that if the Planner has failed in any particular to make proper use of the specialist information provided this may be pointed out and the matter further considered. Any other procedure is almost nonsensical. The notion that such a plan can be prepared by a number of specialists sitting round a table, each contributing to the plan those aspects of it covered by his own speciality is fantastic.

It should now be possible to look at some of the professions and skills connected with Planning, to consider how they contribute to the Planning process and the extent to which the Planner himself needs to have knowledge of them.

Architectural Design and Building Construction

Most changes in the use of land involve the erection of buildings, and although a Planner need not be an expert designer of buildings or be capable of working out in detail such problems as the load-bearing capacity of structures, he needs to know enough to understand the architect's problems and to produce designs which, in terms of shape and size of sites and of road layout, enable the architect to give of his best, to forecast what kind of buildings can successfully be erected on a given site, to appreciate the constructional factors which affect the shape and size of buildings and which limit the choice of building materials. He must also understand the relationship between internal design and external appearance so that he is not led into suggesting architectural absurdities.

What has been said about architecture applies so similarly to landscape architecture that this need not be discussed separately.

Valuation

The value of land and buildings for different purposes also concerns the Planner, since, as already suggested, he must not put forward proposals for the use of land which will not pay, unless they are uses, such as open spaces, playing fields, schools or civic buildings which by their nature can hardly be

economically self-supporting. To this end he should have some knowledge of valuation theory and practice, but here it is necessary to digress in order to explicate a widely accepted fallacy.

This may be stated as the belief that land values dominate Planning proposals, that the valuer can appropriately be regarded as a dominant influence in formulating such proposals, and that the Planner requires a profound knowledge of valuation. The boot, it seems to me, is on the other foot. Sound Planning involves the allocation of land uses in such a way that a convenient and well-integrated pattern of uses is created, a pattern which will attract residents, in which, because of its attractiveness and convenience, they will gladly live, and one which provides commercial sites well located to exploit the consumer demands of the residents thus attracted. In other words, the measure of successful Planning design is the degree of satisfaction of all who live and work within it. The valuer is well qualified to express this degree of satisfaction in terms of money and his experience also enables him to predict the amount of satisfaction likely to be occasioned by a particular scheme, but he is not qualified to create the design any more than the printer is qualified to write the book or the art dealer to paint the picture. The skills of the Planner are infinitely more varied and complicated, and require creative ability quite irrelevant to that of the valuer.

This fundamental difference exists also as between the Planner and the geographer, the economist and the sociologist. Profoundly valuable though the knowledge of all of them is to the Planner in providing background data, it does not assist him in acquiring the vital ability to design.

There has, however, lately emerged one particular valuation technique of very special importance to the Planning process. This is summed up in the term "the Planning balance-sheet", and is ably and fully set out by N. Lichfield in his book "Economics of Planned Development." Very briefly, the argument which Dr. Lichfield states is that although there are many advantages and disadvantages attaching to alternative methods of developing a particular area which cannot be reduced to money terms, there nevertheless are a great many which can be so expressed, and that these, when set out in appropriate form so as to be fully comparable, enable Planning policy to be drawn up on a basis of fact rather than of intuition or prejudice. Though Lichfield would, I think, be the last to deny that financially non-measurable aspects may sometimes properly prevail over the financially measurable, this is a technique of the utmost value, as yet in its infancy but worthy of the greatest attention and development.

Sociology

The role of the sociologist in Planning is extremely difficult to define. The discovery of social habits and preferences relevant to land use is of obvious importance, and clearly can be most effectively carried out by sociologists. Professor Simey's remarks quoted on page 10, which I would endorse, seem to me to indicate that there is some danger in allotting more ambitious Planning tasks to sociologists. This does not apply to the work of the demographer, who can provide data of immense importance to the establishment of Planning standards, as will be seen in Chapters 5, 8 and 16.

Engineering

The provision of buildings involves also the provision of the necessary services to convey power and water to them and to conduct wastes from them, and of roads to give access to them. This is the province of the engineer, and again, although the Planner need not have intimate knowledge of the detailed processes of road and sewer construction, etc., he must know the limiting factors governing their provision and the relative costs of different methods. His knowledge of sewerage should, for example, go sufficiently far to enable him to calculate the sizes of sewers necessary to serve a given amount of development, but certainly need not extend to expert knowledge of the processes of sewage purification.

Geology

This is a subject which, although it is both literally and metaphorically fundamental to Planning, has comparatively little direct influence upon Planning proposals. Although the Planner will find it useful to know the general characteristics of most common types of soils and rocks, their strength, permeability and fertility, any detailed specialist knowledge would be likely to be comparatively little used. In the field of applied geology understanding of the characteristics, location and methods of winning minerals by surface working is, of course, invaluable.

Agriculture

The Planner has at present little direct influence on agriculture; though he can help to maintain a satisfactory distribution of agricultural population by encouraging the creation and enlargement of adequate rural centres, and he can have a large say in determining the siting of individual agricultural workers' houses, he is not in a position to bring about changes in the structure of the industry. It has been said, for example, that the agricultural productivity of this country could be greatly increased by a drastic rearrangement of the boundaries of farm units, and the bringing about of this might reasonably be considered part of the function of the land Planner; in point of fact legislation has not yet given him any say in the matter. There is an aspect of agriculture, however, with which he is intimately concerned, and that is the choice of agricultural land to be sacrificed to other uses. Although he will receive a great quantity of expert and semi-expert advice on the subject whenever he proposes that land should be so sacrificed, and the agriculturist may be depended upon to put up a sturdy fight against any development which is not self-evidently inevitable, it will nevertheless save the Planner much time and trouble if he has sufficient knowledge of the agricultural system to ensure that he is aware of at least the main agricultural implications of his proposals.

Law

The law is one of the Planner's tools; he must know the extent to which it limits his activities both in kind and in degree. No intimate knowledge of legal detail is necessary except as regards the limitations on control of

development imposed by, e.g., the General Development Order and the Use Classes Order, since he will have to resort to qualified legal advice before taking any action with legal implications, but, as with agriculture, he will save himself much grief if his knowledge of the law is sufficient to prevent him making recommendations which are legally untenable.

Government Structure

A knowledge of the machinery of Central and Local Government is of great importance. Consultation and co-operation with many Central and Local Government Departments is indispensable and often obligatory, and a clear understanding of the powers, constitution and duties of each of them is vital. A lively appreciation of the spirit of British constitutional practice is, too, among the most important of the Planner's needs.

Geography

It should be obvious that physical, economic and human geography are all directly and intimately linked with Planning and can provide the Planner with a very large proportion of the basic knowledge he requires. Among the subjects suitable for study preliminary to Planning, geography must hold a very high place.

Economics

This, too, is basic to Planning. What is required is something more than the economics of land values. An appreciation of the general economic problems of industry, the site, labour and transport requirements of different industries, at least in general terms, an ability to interpret statistical information and an understanding of the complicated economic linkages between different activities are all of enormous importance. In particular, the Planner needs to be in a position to indicate not merely the activities which would be harmless on a particular site, but those which would be most successful there and, conversely, to be able to select suitable sites for particular activities.

Finally, the Schuster Report rightly emphasised the need for Planners to be people of wide culture, and this ought, perhaps, more specially to include a knowledge of the world and its ways, a sense of history and of human destiny.

It follows from this very condensed summary that much of the design skill necessary to the Planner depends for its successful exercise upon his ability to evaluate and synthesise the information relating to whichever combination of the subjects mentioned applies to a particular Planning problem. Indeed, Planning design springs so directly from this synthesis that it can hardly be separated from it, hence the doubtful validity of the Schuster Report's view that it partakes more of administration.

Nothing has yet been said to refute the common allegation that the Planner is a jack of all trades and master of none or to indicate the nature of any special skill he possesses which is not merely derived from knowledge of the

background subjects listed. It lies, I suggest, in the ability to determine the appropriate relation of land uses spatially and quantitatively and to create a design which expresses this relation without violating other needs. This is the core of Planning skill; to reach the highest levels it needs to be accompanied by the ability to discern those aspects of a particular subject which are of particular Planning importance and to master these in some detail, together with the broad appreciation of the subject as a whole which such mastery entails. There is nothing superhuman about this ability; it is one possessed, in somewhat different fashions, by the barrister and by the able journalist, and there is nothing superficial or meretricious about it.

It must be noted that the only skills listed above as contributory to Planning which involve creative visual design are those of the architect and landscape architect. In terms, therefore, of a post-graduate approach to Planning the architect is at a considerable advantage, as compared with the engineer and the surveyor. He, like them, is ignorant of many of the subjects comprised in a Planning course, but, unlike them, he is an adept in design and is likely to be able to transfer his skill to the new subject much more quickly than they can acquire a completely new faculty. He suffers from some disadvantages; his knowledge of law and land values is, for example, likely to be rudimentary compared with that of the chartered surveyor, but on the whole he starts well ahead.

While the architect is in a singularly advantageous position in mastering the problems of detailed small-scale planning, he has no special knowledge at all of the factors governing Regional Planning. Conversely, the geographer's training gives him great initial advantages in dealing with Regional Planning, but none at all in detailed design. These two, the architect and the geographer, stand at the extreme ends of the Planning field. Their spheres of knowledge do not intersect, and it must be the task of the Planner to fill the considerable gap.

I cannot conclude this chapter without recording my belief that, for those who are able to take one, a course of full-time Undergraduate study of the kind provided at Durham and Manchester is likely to be the most satisfactory preparation for a career in Planning, and I do not share the Schuster Committee's doubts about this. Planning is a subject which requires great width and depth of study. There seems little point in spending several years taking a degree in some subject of general educational value when an adequate preparation for Planning itself involves a variety of subject-matter, related always to human needs and human character, sufficient to constitute a liberal education, and which, even if the graduate eventually decided to take up some other career, would give him a framework of knowledge more than ordinarily useful as a foundation for many kinds of more specialised learning.

Below is a summary of the examination syllabus of the Town Planning Institute. It is given in very general form, since it is liable to changes in detail at any time, and the printing here of more detailed summaries might, therefore, lead to confusion. The syllabuses of Planning Schools recognised by the Town Planning Institute include a similar range of subjects, with, naturally, fairly wide variations in arrangement and emphasis.

Town Planning Institute Examinations

INTERMEDIATE EXAMINATION

Open to candidates over 18 who have a General Certificate of Education with passes in five subjects at the ordinary level or who possess comparable educational attainments.

Part I

Testimonies of study including measured drawings, freehand sketches, a survey, an historical study, a set problem in design and working drawings.

Part II

Written examinations in :—

- Elementary Construction of Buildings, Road and Bridges.
- Surveying and Levelling (a practical examination also).
- Historical Development of Planning.
- Central and Local Government.
- Outlines of Planning Law.
- Elements of Applied Geology and Economic Geography.
- One Day Design.

FINAL EXAMINATION

Open to candidates over 21 who have passed the Intermediate Examination of the Institute or the Final Examination of the R.I.B.A., the I.C.E., the I.Mun.E. or the R.I.C.S. (or an examination carrying exemption therefrom) or who hold an approved degree in Civil Engineering, Economics or Geography.

Part I

Testimonies of Study

General: Three drawn exercises in design or an essay of about 5,000 words on a subject related to economic, geographical, social or other aspects of Planning. The subjects in all cases are set by the Board.

Special: A Survey and Analysis, Plan and Design and Programme of Development for an area chosen for himself by each candidate.

Part II

Written examinations in :—

- Historical Development of Planning. (Holders of T.P.I. Intermediate are exempt).
- Outlines of Social and Economical Organisation. (Holders of Degrees in Geography or Economics are exempt).
- Town Planning Practice.
- Architectural and Landscape Design in relation to Planning. (Architects are exempt).
- Civil Engineering in relation to Planning. (Engineers are exempt).
- Economics of Land Use. (Chartered Surveyors are exempt).
- Law in relation to Planning.

A sketch plan and report also has to be made in half a day after a site inspection.

CHAPTER 3

VISUAL PRESENTATION FOR PLANNING PURPOSES

3-1. INTRODUCTORY

IT IS IMPORTANT that visual information relating to Planning should be attractively presented. The first essential is that its general meaning should be speedily apparent and that, on further inspection, its details should be capable of being easily and accurately read. If a map, for example, meets these requirements it is almost certain to have a crisp and attractive appearance, for they necessitate the maximum legibility and appropriate variation in size and style of lettering, harmony between colours, proper weight of hatching, and cleanness of line. However, something more than this is needed; touches of artistry going beyond mere clarity and efficiency arouse and sustain the interest of the viewer, which otherwise flags all too speedily, particularly when a number of different maps have to be inspected at one time.

Most of this chapter applies to the presentation both of Planning proposals and of survey data, but the latter present more diverse and difficult problems in presentation than do the former.

The most convenient arrangement will be to deal first with maps and diagrams in map form, second with diagrams not in map form and finally with models and other methods of three dimensional representation.

3-2. MAPS AND DIAGRAMS

These are the most frequently used forms of presentation; great variety is possible in the techniques employed.

The kinds of maps required from the point of view of the different presentation techniques they demand, fall naturally into five classes: those showing:—

- (1) Factors or areas of different character but of approximately equal importance, e.g. Land Use, Farm Units.
- (2) Factors of the same kind but of differing intensity, e.g. Density, Age of buildings
- (3) Flows, e.g. Traffic, Population changes.
- (4) Distribution of Service Centres combined with representation of their service areas, e.g. Shops, Schools.
- (5) Comparison of different subjects, e.g. Land Availability sieve, Comparison of Density and Disease Incidence.

To solve the problems of presentation which these pose, the means available can be classified as:—

- (1) Hatching and Stippling.
- (2) Edging.
- (3) Covering areas with colour washes.
- (4) Symbols.
- (5) Directional signs.
- (6) Overlays.

These items can be combined in numerous ways, and it is safe to say that the complexity of a satisfactory map is limited, not by the total number of items which can be distinctly shown, but by the variety which the human mind can comprehend without becoming confused.

It is also necessary to distinguish between the purposes intended to be fulfilled by maps, which greatly affects the techniques used. A completely clear-cut classification is hardly possible, but the following indicates the most widely differing purposes :

(1) Maps which merely record information without trying to present a vivid, comprehensive picture, e.g. Routes and capacities of Public Utility Services.

(2) Maps, primarily for the perusal of laymen, which attempt to present the facts dealt with in the simplest, most quickly assimilable fashion possible.

(3) Maps which aim at the maximum clarity, but also present their information in considerable detail.

The most successful examples of this third type are so arranged that their essential meaning is at once apparent but, without detriment to this, yield further, more detailed information when closely studied. Most of the survey maps actually used as the basis for formulating Development Plans and Development Plan maps themselves fall within this class.

Base Maps. The success or failure of a set of Planning maps depends to a very large extent upon the suitability of the base maps used. A base map may be defined as a map which shows the existing physical pattern of land, upon which survey information or Planning proposals are superimposed.

The perfect base map is one which gives just enough detail, but no more, to make the information superimposed on it fully comprehensible.

The Ordnance Survey of Great Britain publishes maps at various scales and provides a map coverage of the country which is unrivalled anywhere in the world. The reader is assumed to be familiar with the use of maps and to have some knowledge of Ordnance Survey maps, but full information about them, including examples, can be found in the Ordnance Survey explanatory handbooks published by the Stationery Office.

Many published Plans and surveys have been prepared with far too little regard to the importance of using suitable base maps; in fact, quite often, almost any map which happened to be immediately available seems to have been utilised. No published Ordnance map is ideal as a base map for Planning purposes—although many are good—since they are produced for the benefit of a variety of users who have different requirements, and the total amount of detail shown is excessive for Planning purposes; nor is any one

base map ideal for a whole series of Planning maps, since different subjects demand the inclusion of different degrees and kinds of detail.

Wherever possible it is most desirable to prepare special base maps in the form of traced adaptations of published Ordnance maps. This is not usually as huge a task as it seems to be at first sight but, in any case, the expenditure of quite a large amount of draughtsman's time is justifiable since it is capable of producing quite disproportionately large benefits.

It is not, of course, *always* possible to produce special base maps; time or money as limiting factors may preclude this being done, and in the case of maps for a very large area which have to be produced on a large scale the sheer volume of work may be too fearsome to contemplate. Where this is the case much can, nevertheless, be done with comparatively little expenditure of time by judicious touching up—strengthening the main roads, emphasising the most important place names by underlining them and similar minor improvements.

The essential purposes of a base map are to enable the location of one set of Planning information to be identified in relation to that on other maps and to show the relationship of the general character of the area to the Planning information superimposed. The map may be so devised that this identification is either quite precise or merely general, the choice depending on the type of information intended to be shown. The more detailed the base map the less will be the degree of clarity with which the information superimposed on it can be shown, but the more easily and precisely can this information be located.

It may be helpful, before making positive suggestions for the preparation of base maps, to cite examples of well-known works which, in one way or another, have failed to meet the requirements already mentioned. That the time and circumstances of some of these works, rather than lack of skill or foresight, must largely have accounted for these defects does not of course invalidate the conclusions drawn.

The base map of the Master Plan in the Greater London Plan is simply the War Department's wartime 1/25,000 map, which itself suffered from excessive reduction of scale, much further reduced. The results are that, in steeply sloping areas, the contour lines fuse together into black masses, a very large proportion of the minor place names are completely illegible and, in many places, the road pattern cannot be followed. The total effect is a barely differentiated, dark grey background which greatly diminishes the clarity of the superimposed colours. In the early stages of post-war Planning the hearing of appeals against development control decisions based on the Plan was often rendered difficult by the inability of the parties concerned to agree upon the boundaries between zones shown in it.

At the other extreme, the base maps used in "English County" (Herefordshire) are so skeletal that, while they certainly do not in the least obscure superimposed colour, they give hardly any assistance in fixing location. In fact, in nearly every case, the base map consists simply of the County Boundary and a few circles indicating the positions of the principal settlements.

Here is a case in which no class of reader is adequately catered for. The Planning information given is far more detailed and extensive than the casual

lay reader could possibly be expected to absorb, yet the form in which it is presented renders it practically unusable for the professional Planner, land-owner or any one else really wanting to appreciate it in detail.

The base map used throughout Gordon Payne's "Survey of Gloucestershire" is imperfect in another quite different way. The amount of detail shown is insufficient but, quite apart from this, what is shown is indefinite. The adoption of a free, somewhat irregular style of draughtsmanship may often not only save a great deal of time but may, in its own right, be highly effective; this, however, is different from indefiniteness. On the Gloucestershire base map the physical extent of communities is shown by weak, ill-defined areas of stippling which frequently disappear beneath the colouring applied. The lettering of the place names, somewhat sprawling and following no discernible convention, leaves one often in doubt as to which stippled area a name refers.

Finally, the base map used for most of the illustrations of "A Planning Basis for Kent" is a brave attempt to make the best of both worlds, which must on the whole be accounted a failure. Here a very faint grey base map is used, a reduction of a small scale ($\frac{1}{2}$ " to one mile) Ordnance Map. In addition, for certain survey maps, specially important items on the base maps are picked out in a thicker black line for emphasis. The failure lies in the fact that, while it is just possible, with infinite patience and a magnifying glass, to fix the location of survey items by reference to the grey base, this is so faint that when the map is inspected in the ordinary way in order to gain a general impression, it has no effect on the eye, while the items picked out in black are insufficient to form an adequate base map in themselves.

I do not believe that the use of a faint detailed base map is desirable. If it is faint enough to enable superimposed information to be clearly read it can hardly have enough strength to form a proper base map, since, for most purposes, it is desirable to read superimposed information in relation to the physical pattern of the area. It might indeed be possible to devise a satisfactory method by which map detail was shown in a faint tone and the outline information necessary for a general appreciation of pattern, varied to suit the special needs of particular base maps, emphasised, but the technical difficulties would be great, particularly in securing sufficiently exact register at a small scale.

The soundest policy generally seems to be to devise base maps so that they consist of the minimum number of lines necessary to achieve their purpose but to print these lines at normal intensity, though some lines may appropriately be stronger than others.

It will be evident that the actual content of base maps will vary not only according to the subject matter to be applied to them but also to the scale at which they are drawn. Thus, for Regional purposes, the scale used might be anywhere between $\frac{1}{4}$ " to one mile and 1/25,000, for Town Planning between 1/25,000 and 1/2,500 and for detailed Planning between 1/2,500 and 1/500. At the same time, the particular scale used, even within one of these general ranges, will, at least in part, be determined by the use to be made of the map. For example, the Diagrammatic base map described below could more appropriately be drawn at $\frac{1}{4}$ " to one mile than at 1/25,000, while the General

Purposes base map would not normally be drawn at less than 1/25,000, though, in some circumstances, with the omission of enclosure boundaries, it would be useful at 1" to one mile. The factors of size, time and money and the character of the area under examination may all operate in different ways to affect the choice of scale.

The problems of maintaining clarity in the event of Planning maps having to be reproduced for publication at a smaller scale are considerable and are not of course confined to base maps. The sizes of symbols, thickness of lines and intervals between lines, together with the size of any lettering added subsequently to the base map, must all be taken into account.

Any important Planning project is quite likely to be published sooner or later; it is most desirable that, from the first, drawings shall be prepared with this possibility in mind. A map which will be suitable for a large degree of reduction is likely to be thereby rendered less than perfect at its original scale, but not to any serious extent. Since the requirements for suitability for reduction lead to some excess of boldness of presentation at the original scale this results in faults on the right side if the originals are exhibited to the public.

The best example which I know of unfortunate results following from failure to anticipate the need for publication is to be seen in the "City of Manchester Plan, 1945," an exceptionally able and important work on Planning. In this book a number of the illustrations are full-colour lithographs, obviously taken from intensely coloured 6" maps. The colours are often too complex to be easily read, partly because the grey colour of the detailed base map dulls them. The base map itself is useless; one cannot identify locations from it except with the greatest difficulty. One can feel tolerably sure that in this case it would have been cheaper and certainly much more satisfactory, even after the preparation of the original maps, to prepare fresh ones for publication with a bold outline base and a simple colour notation.

At the Regional level there should ideally be four base maps :—

(1) *Diagrammatic*, to show in barest outline the pattern of the area, on which would be presented data such as flows and service areas, for which extents and boundaries only are of importance and intervening detail is no more than a distraction.

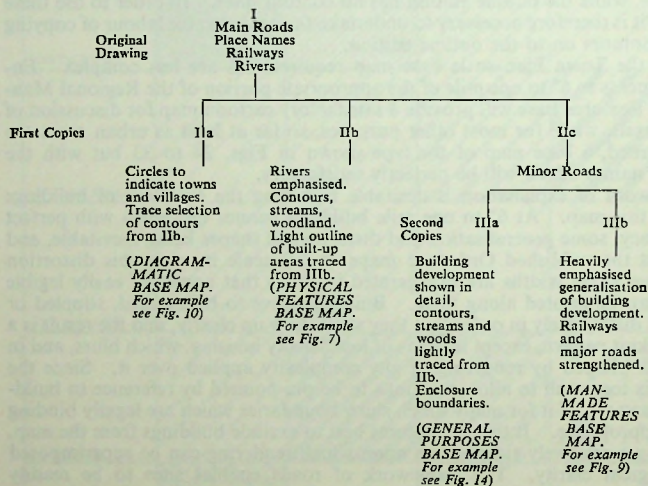
(2) *Physical Features*, which emphasises the natural at the expense of the artificial pattern, on which would be shown principally topographical data.

(3) *Man-made Features*, on which the emphasis is the reverse of that on (2). This would be used for more detailed information regarding service areas and accessibility than could be shown on (1) but its most important use would be for the presentation of outline Planning proposals and survey analysis in cartoon form for special purposes.

(4) *General Purposes*, for presenting subject-matter without any special bias towards natural or artificial features. Outline Land Use and Planning proposals are examples of the subjects for which this base would be used.

At the 1/25,000 scale this map would be so similar to the published Ordnance Maps, with the omission of some detail irrelevant to Planning purposes, that one hardly would be justified in preparing such a map for a very large area because of the great amount of work entailed.

Careful forethought should enable substantial economies in time to be effected in preparing different styles of base map for the same area. The principle is to draw first the material common to all four and have transparencies made of this, adding further material required for each different base. The following table gives an indication of how this might be done.



It will be seen that some items have to be strengthened on some of the copies, but this can be done very rapidly when the lines are already shown on the drawing; again, some items have necessarily to be traced twice, but these are taken from the tracing already made, and it is much easier and quicker to retrace from a selective tracing than from a fully detailed Ordnance map. With great care, it might be possible to reduce even this amount of duplication of work; provided perfect register could be obtained, any item which did not appear on all the versions could be drawn on a separate piece of material and overprinted on to the versions in which it was required. The only duplication of work which would then remain would be the emphasis of some items on some of the base maps.

It should be noted that the complete mechanisation of this kind of work is hardly possible. Various items require different degrees of exaggeration in size and thickness of line, and, in adding items to material previously traced and printed, a certain amount of erasure and adjustment will inevitably be

necessary in order to obtain well balanced appearance. It is, for example, very difficult to position the place names on the first drawings in such a way that none of them will be obscured by detail subsequently added to one or more of the copies.

It must be mentioned at this point that the present method of publishing 1" to one mile and 1/25,000 Ordnance sheets greatly reduces their usefulness as base maps, even if it is considered that for some purposes they are close enough to the ideal to justify omission of specially drawn maps. It is not possible to add further colour to the coloured edition and obtain satisfactory results, while the outline edition has no contour lines. In order to use these maps it is therefore necessary to undertake the considerable labour of copying the contours on to the outline edition.

At the Town Plan scale base map requirements are less complex. Enlargements to 6" to one mile of the appropriate portion of the Regional Man-made Features Base will provide a satisfactory cartoon map for discussion of proposals, while for most other purposes, so far at least as urban areas are concerned, a base map of the type shown in Figs. 24 to 33 but with the street names added will be perfectly satisfactory.

A word of explanation is desirable regarding the omission of buildings from this map. At 6" to one mile buildings cannot be shown with perfect accuracy, some generalisation and distortion of shapes being inevitable, and indeed the published Ordnance maps at this scale increase this distortion because street widths are exaggerated in order that names of easily legible size can be printed along them. Buildings have to be hatched, stippled or tinted distinctively in order that they shall show up clearly, and the result is a close knit pattern, except in areas of low density housing, which blurs, and in turn is blurred by rendering of any complexity applied over it. Since the scale is too small to allow positions to be pin-pointed by reference to buildings, any use of it for maps which show boundaries which are legally binding is inappropriate. It therefore seems best to exclude buildings from the map, leaving a relatively simple base upon which rendering can be superimposed with great clarity. The framework of roads enables sites to be readily identified to a degree of accuracy quite sufficient for the type of information which can be shown at the 6" scale, and ease of identification is of course greatly increased if all roads are named.

Outside built-up areas the ordinary pattern of field boundaries can be shown, while both inside and outside these areas there is every justification for aiding legibility by showing important isolated buildings as reference points.

Naturally, the orthodox type of 6" map gives a better general picture of the character of the town since it provides a rough impression of relative building densities, but as a base for individual surveys and for proposals, that just described is preferable.

General considerations governing Technique employed

The advantages and disadvantages of the different methods of presentation will now be considered in order to clear the way for discussion of the best ways of presenting the five principal classes of maps previously listed.

There are, however, two broad sub-divisions which cut across this classifi-

cation: first, between monochrome and colour technique and, second, between the use of series of overlays and of single composite maps for the purpose of comparing a number of factors.

Monochrome presentation, as its name implies, does not rely upon colour contrast to denote differentiation but secures the desired effect solely by variations of density, texture and/or direction in the lines, edgings and symbols used. Its principal advantage is that once the first copy of a map has been made an unlimited number of reproductions can be obtained without further drafting work. The principal disadvantage is that there is a limit to the number of different kinds of information that can be shown on a single monochrome map, whereas, with the use of colour, the changes that can be made by combining backgrounds of one colour with edgings of another, varying the depth of tone of each tint, and combining variety of colour and variety of density and direction in the hatchings etc. used are practically infinite.

Fig. 12 is an example of monochrome technique stretched beyond the limit of full effectiveness. While it is possible that further experiment with and revision of the notation used would effect an improvement, it could still not approach the clarity attainable with a coloured notation.

I have often wondered whether it would not be possible to devise notations which would serve for both coloured and monochrome maps. The object would be to prepare full coloured maps as master copies which would embody the highest possible degree of clarity and interest, but with the colour schemes so devised that, when photographed in monochrome, each separate colour would show up as a distinctive tone. The problem is complicated by the fact that the effect produced on a photograph depends not only upon the visible intensity of the colour but upon the physical structure of the material from which it has been manufactured, but success does not seem to be beyond the bounds of possibility and would ease so many problems that investigation is desirable.

It is often possible to add one or more coloured areas to a monochrome map with great effect and quite rapidly, the boundaries of all factors having already been plotted in monochrome. One purpose for which this is particularly useful is the emphasis of a particular use on a Use Survey Map. It is sometimes desired to show the distribution within a town of each of a number of uses, and this can conveniently be done by preparing a Monochrome Use Map, taking from it as many prints as the uses to be isolated, and colouring appropriately on each of them all the areas devoted to one such use.

The disadvantage of colour used merely as flat washes, with or without edgings, is that it gives little scope for indicating the overlapping of factors. When a blue area and a yellow area overlap, the overlapping portion will of course show up clearly as green, with an obvious affinity to each, but the extent to which this technique can be applied without loss of clarity is very limited.

Turning to the relative merits of overlays and composite maps for the purpose of comparison, the first point to note is that overlays have numerous theoretical advantages. Each separate survey subject, drawn in monochrome or on a transparency, can be treated as a map in its own right, be

reproduced on ordinary prints and coloured if desired. Or it can be placed over a base map, together with any combination of other subjects desired, and compared with them; by experimenting with different combinations significant correlations of data apparently unconnected may reveal themselves. Any interesting combination of subjects can be printed to form a composite map.

These advantages appear overwhelming but the difficulties of securing and maintaining perfect register simultaneously between a number of overlays and a base map are sufficiently great to discourage much light-hearted shuffling in order to discover interesting relationships; even if differential expansion or contraction of the sheets does not upset the register it is hard to fix a number of them precisely in position one above the other. However transparent the material used for the overlays it always seems difficult to read the lowermost when a number are superimposed. Finally, the notations for a number of overlays must be worked out systematically beforehand if they are not to clash and obscure each other.

In my opinion it is better to confine the use of overlays to rough preliminary work, when indeed they may prove interesting and revealing. If, for any reason, the use of overlays in finished form were considered essential, it would probably be more successful to begin with a composite map and then, by copying each factor on to a separate sheet, to "explode" it into overlays, but this procedure would of course entirely eliminate the saving of time claimed for overlays.

The terms "hatching", "stippling", "washes", and "symbols", are not entirely mutually exclusive. "Wash", as used in this chapter, means an area of uniform colour or an area treated to give that effect. A more familiar word is "tint", but this might give rise to confusion, since, in the printing trade, "tint" often means a fine stipple. A very fine coloured stipple gives the effect of a wash, a coarse stipple is virtually the same as a close pattern of symbols, as is hatching with widely broken lines. This being understood, it is sufficient to say that the following observations relate to average examples of each of these types of rendering rather than those which are close to merging with another.

Hatchings may be differentiated from each other in a number of ways; the lines, or more accurately bands, may be of varying colour, width, direction or texture, and the spaces between them can also be varied in width. (See Fig. 3). There is in fact almost no end to the number of different effects which can be obtained; the practical limit is set by the limited number of directions possible and by the fact that two or more sets of parallel or nearly parallel bands produce visual confusion. It is a good rule to stop well before this begins and to turn to other means of indicating the remaining factors which have to be shown.

A particularly effective way of using hatchings, though very laborious to draw unless mechanical aids are used, is to cover the areas to be shown with a series of very fine lines drawn close together; if the colour and direction of these lines are both varied a very sharply differentiated effect is given.

Patterns of symbols are especially suitable for items covering a large proportion of the map. They may consist of squares, oblongs, triangles, circles or in fact any shape capable of being drawn quickly and accurately in large numbers. A variation of this is to use symbols which suggest the character of the area they cover—e.g. ears of wheat for arable land. If this is

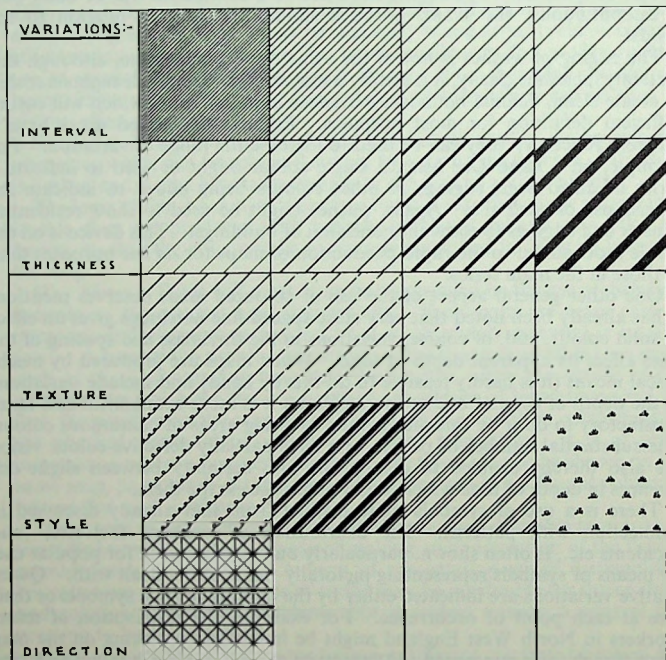


FIG. 3. Some of the numerous variations obtainable by means of hatchings.

done it is necessary to cut stencils so that the symbols shall be uniform; this method can be very effective if used with restraint, but it is all too easy to give the map a florid and somewhat absurd appearance. If the sizes of the actual symbols and their spacings are carefully balanced the areas so delineated can be shown up prominently, yet underlying information is only very slightly obscured.

Stipples are midway between washes and patterns of symbols. The actual areas of colour are reduced to little more than points, yet their spacing is close enough to give the effect of a light toned wash.

It is desirable that every area distinguished by hatching, symbols or stipple is appropriately edged. Even with a very close hatching the shape of the area enclosed by it appears blurred and uncertain unless it is also edged. The edging should, of course, be of the same colour as the hatching etc., but its width should also be related as closely as possible to the width of hatching or size of symbols. The edging need not be a continuous line or band but, if discontinuous, the blank portions should be short in relation to the solids.

The edging of washes is not of the same importance, since, although this certainly increases clarity, it is simply a matter of competent draughtsmanship to create clean, definite boundaries between coloured areas which will ensure sufficient definition for most purposes. Edgings to washed areas have a different function; they can be used to increase the range of variation. For example, on a Land Use Map, a single colour might be used to indicate a series of allied uses, edgings in other colours being added to indicate the precise use of each site. Again, washes might be used to show residential density and edgings to show the condition of buildings. This device is on the whole more suited to the rapid production of maps for *ad hoc* purposes than to those in the main series.

One other general aspect of the use of coloured areas deserves mention. It has already been noted that very close spaced fine hatchings gives an effect of solid colour, and, of course, variations in the thickness and spacing of the lines affect its apparent depth of tone. When maps are produced by mechanical means (it is hardly feasible to do this by hand) and include variations in the depth of tone of one or more colours it is more economical and more satisfactory to do it by this means than by using areas of continuous colour. The substantial number of people who have partially defective colour vision are also thereby enabled to distinguish with certainty between slight differences in depth of tone which might otherwise escape them.

There is a use of symbols quite distinct from that already discussed in connection with patterns. The distribution of workers, factories, road accidents etc., is often shown, particularly on maps intended for popular use, by means of symbols representing pictorially the subjects dealt with. Quantitative variations are indicated either by the number of such symbols or their size at each point of occurrence. For example, the distribution of mine-workers in North West England might be indicated by placing on the map against each town concerned a little isotype or pictogram of a miner swinging a pick for each 500 mineworkers employed there, or alternatively by means of a single isotype for each town, its size depending on the number of mine-workers employed.

I am not enthusiastic about either of these methods, believing that better results can generally be obtained by simpler means, such as coloured bars of varying length. Nevertheless, they have the not unimportant merit of presenting an immediate vivid impression if they are kept within bounds. Generally speaking the second alternative is preferable, for, with the first, it is often very difficult to keep platoons of miners, clerks, milkmaids or oast-houses sufficiently compact for any real sense of location to be preserved; frequently they seem to sprawl all over the map, and it is very hard to under-

stand to which town or village a particular group of symbols relates. When an attempt is made to indicate on one map the distribution of a number of different items, this method nearly always fails.

The second method avoids the lack of compactness of the first provided one subject only is dealt with, but when an attempt is made to summarise a series of subjects on one map the effect is often ludicrous, with gigantic milkmaids, tiny miners and medium-sized brewers' draymen jostling each other in wild abandon. One rule needs to be observed. Since the symbols used nearly always represent three dimensional objects their heights and widths should vary as the cube root of the total amounts represented. Thus a symbol representing 27,000 transport workers will be 3 times, not 27 times, as high as that representing only 1,000.

Little can be said about what, for lack of a better name, have been referred to as directional signs. They range from the precisely measured strips which indicate the amounts and routes of traffic determined by an origin and destination census to the tentative, many-headed arrows which seek to give an impression, unconfirmed by full survey, of the different service centres used by the inhabitants of a residential area. This perhaps suggests the only firm principle which can be advanced; that the definiteness of such signs should be proportionate to the reliability of the information they give.

Materials

Various media can be used for rendering maps with colour; the most generally used are water-colours. These are cheap, available in a wide range and do not obscure the map detail beneath, but they have to be mixed with water to the required strength, and where the whole of the area for which a particular colour is required cannot be coloured at one sitting it may be a matter of some difficulty to match up when resuming work.

This difficulty is overcome with the Planning dyes specially prepared for colouring Planning maps. These are ready mixed and need no dilution; their other characteristics are similar to those of water-colours, but they are much more expensive and they have a marked tendency to "creep" into each other along the boundary between different colours, which sometimes makes it difficult to obtain a clean and crisp effect. Both water-colours and dyes are, in some colours, very difficult to apply evenly, due mainly in the case of water-colours to sedimentation taking place, and in the case of dyes to over-rapid drying.

Drawing inks are useful for some purposes; many of them are waterproof, which dyes and water-colours are not, but many of them are impossible to apply evenly over a large area. The number of different colours made is limited, and, owing to their chemical composition, a good many of them cannot be mixed satisfactorily. Their usefulness is greater for line work than for colouring areas.

Poster colours are extremely vivid but are opaque, completely hiding the map detail beneath, which disqualifies them for all but a very few Planning purposes; also, after application, they tend to flake away from the surface of the paper.

Coloured pencils and crayons are useful for rapid, sketchy work, but their

lack of permanence and evenness make them unsuitable for maps for which a first-class finish is required.

Very interesting effects can be obtained by spraying colours on to maps, either with a mouth-operated spray or with an air brush. By these methods the intensity and texture of colours can be widely varied. Further, with sprays it is possible to a limited extent to indicate the overlapping of different factors, which cannot be done successfully by means of colour applied in the ordinary way. The use of sprays produces a very lively map, and interest is enhanced if some of the smaller areas are coloured in the normal fashion, sprays being used only for the larger areas. This has the advantage of reducing the number of masks that have to be prepared. The need of masks is, in fact, the principal disadvantage of spraying; they have to be cut with great precision so that all parts of the drawing not required to be rendered with a spray are covered. For ease of working, masks are usually made of paper, which is liable to stretch as it becomes impregnated with sprayed colour, so that after a mask has been used several times it becomes useless and has to be replaced. It is, therefore, impracticable to prepare many copies of the same drawing by this method; its use is generally confined to a few display maps for which a particularly high standard is required. The use of both hatchings and colours on the same map is another method of producing a specially lively effect.

In recent years, one particular form of mechanical aid has been much used in the preparation of Planning maps, namely a transparent plastic material adhesive on one side, sold in convenient sized sheets printed with a large variety of hatchings and symbols. This is obtainable under two proprietary names, "Zip-a-tone" and "Plastitone"; the main usefulness of this material is of course in preparing monochrome maps, but it can also be used to a limited extent for coloured maps.

Application of the principles suggested to basic types of Planning Maps

These types were set out on page 23 and are now dealt with in the same order :

(1) *Maps showing factors or areas of different character but of approximately equal importance.* In order that a true picture may be presented it is essential that the notation used shall not unduly accentuate any particular area. Thus, if colours are used they should be of about equal intensity, hatchings should be differentiated by changes of colour, direction and texture rather than by variation of spacing or width of line, this rule being applicable also to stipples and patterns of symbols.

In the case of Land Use Maps the matter is rendered more complex because intensity of use needs to be given some visual expression even though it may be difficult to assess, and on the other hand many quite different uses are of equal importance. The very large number of items required for this map, with the consequent elaboration of notation entailed, makes it difficult to pursue a consistent and straightforward policy.

(2) *Maps showing factors of the same kind but differing intensity.* In this case, clearly enough, the considerations which apply are almost

exactly the reverse of those in the previous one. Variety in the intensity of the rendering applied is to be desired rather than variety of colour, shape or direction. Nearly every map of this kind is in essence similar to an ordinary physical contour map except that in some cases the grading is discontinuous rather than continuous.

The exact technique adopted depends mainly upon the number of different grades which have to be distinguished. If colour is used and the number of grades is large it may be necessary to use several related colours of increasing intensity instead of the more satisfactory device of restricting use to several intensities of a single colour. For example, raw sienna, burnt sienna and burnt umber is a range of colours which can be used to give an effect of continuity.

Similarly, if stipples are used, the number of readily distinguishable intensities which can be achieved simply by varying the spacing of the dots is limited and it may become necessary to use dots of a different size.

The logic of this, no doubt, is obvious but it is surprising how many maps in this class are produced with entirely unrelated colours of similar intensity, so that the key must be constantly consulted in order to interpret the map.

(3) *Flows.* These will most often be represented by the use of direction indicators; the greatest need is simplicity. Such maps are never easy to interpret, and elaboration beyond what is absolutely essential is usually fatal. A great aid to simplicity is the use of the simplest possible base maps such as the diagrammatic base described earlier, since the details of the country over which the flows take place are seldom of importance and, in fact, the position on the map of the indicators may not even correspond to the physical routes along which such flows take place. It is of great importance, where a number of unconnected flows have to be shown on the same map, particularly if they cross each other, to use a different colour or texture for each indicator.

In the case of maps showing traffic flows it is often desirable to prepare a simplified version for the purpose of making an appreciation of the fundamental problems involved. A form of presentation which distinguishes between several different types of traffic may be invaluable for the analysis and solution of detailed problems, but it seldom enables a general impression to be easily gained.

Other maps showing movement require different treatment because the movements concerned are not from one specific point to another, but consist of a gradual redistribution. A typical example is a map showing changes in the density of population in different parts of an area. The most usual way of presenting this is to show increases in red, decreases in blue, the intensity of the colour in each case being related to the degree of change. Alternatively, where the situation has to be shown also at one or more intermediate stages, the best method is to use several diagrammatic maps of the smallest practicable scale, mounted on a single sheet, and to show the densities prevailing at a given stage on each. Provided the units over which density is measured are the same in each case comparison is simple.

(4) *Distribution of Service Centres and extent of Service areas.* This is another subject for the representation of which symbols are often used—a mortar board for a school, a bed for a hospital and so on. Used with great restraint these symbols may be useful, but if, as is often the case, it is necessary to indicate the presence or absence of a considerable number of service facilities it becomes difficult to devise sufficient self-explanatory symbols—and unless they are self-explanatory they are useless. In these circumstances it is better to use a grid or similar device, each sub-division of which represents a particular service; where a particular service is available the appropriate sub-division is filled in, otherwise it is left blank. Frequent reference to the key to discover which sub-division refers to which facility is entailed at first, but after quite a short time the positions become fixed in the memory. A refinement would be to draw a very small symbol within each sub-division to remove this necessity, but it is doubtful whether the considerable extra work involved would often be justified.

There are two methods of indicating the areas served by centres. The first, is to draw rays from each minor community to the place or places on which it relies for the services it cannot itself supply; this may be sufficient but can be reinforced by outlining the boundary of each service area (they will usually overlap considerably) with a distinctive band. The second is to hatch or colour each area of influence distinctively.

For all maps of this kind an outline diagrammatic base should be used, as the physical characteristics of the area are only important as regards their broader aspects—ranges of hills, rivers and other physical barriers tending to distort service areas, which will be shown even on an outline base.

(5) *Maps dealing with several subjects.* “One subject one map” is a very good rule, so that it is not surprising that maps of this kind, usually sieve maps, which are a deliberate violation of the rule, entail the most difficult problems of presentation.

The term “sieve” is used metaphorically. It is assumed that all the land under examination is “passed” through a series of sieves, each of which represents some characteristic rendering land unfit for the particular purpose being considered, often, as in the example described below, large-scale building development, although the method can be applied to many other subjects. Any land possessing characteristics represented by one or more of the sieves is “caught”, while that which passes through all of them is *prima facie* suitable for the purpose concerned.

Sieve maps constitute a most valuable means of summarising and analysing survey data.

Discussion will be confined to colour notations, and should be understood to refer principally to sieve maps showing the suitability of land for large scale development.

There is endless scope for ingenuity in working out the details of such notations but, as regards the general basis, only one method has so far been devised which is wholly satisfactory.

The map creates formidable presentation problems. It is necessarily extremely complicated; the boundaries of each of numerous overlapping

areas must be absolutely distinct and the hatchings, etc., which cover them must be arranged so that they do not coincide. No very specific suggestions can be made for the design of a notation, since this will be affected by the number and prevalence of the factors affecting a particular region, but four general principles should be observed :—

(a) The areas affected by each factor should be indicated both by an edging and by a hatching or pattern of symbols.

(b) The larger the area affected by a particular factor the wider should be the spacing of the hatching etc., and the more important the factor the more prominent should it be.

(c) The land in each area should be washed in a lighter shade of the colour used for the edging and hatching of the most strongly disqualifying factor affecting that area. For example, assume the strength of disqualification to be, in descending order, steep slopes, high agricultural value, high landscape value; then all areas subject to steep slopes would be washed in the steep slope colour, areas not subject to the steep slope factor but subject to the other two or to agricultural value only would be washed in the high agricultural value colour, and areas subject to high landscape value only would be washed in that colour. This means that in any given area the dominant factor is indicated both by edging and hatching and by a wash, and the lesser factors by edging and hatching only. This treatment greatly increases the intelligibility of the map.

(d) Only areas *unsuitable* for development must be shown; any mixture of favourable and unfavourable factors reduces the map almost to illegibility. It would, no doubt, be possible to prepare a positive rather than a negative map, i.e. one showing degrees of suitability for development rather than of unsuitability, but it would necessarily be less definite and selective, since most disqualifying factors cover only a comparatively small proportion of the total area, and by this method the most suitable areas, instead of being left blank, would be covered by so large a number of hatchings that differences between them would not easily be appreciated.

To make clear what is meant by a mixture, suppose that there are, among other factors, a few areas of steep slope in a survey area and only a few areas capable of being readily sewered. The obvious way to indicate these is to hatch both types of area, but this is wrong; it would result in the two hatched areas meaning opposite things. The steep areas should be hatched and all the areas not readily capable of being sewered; the hatched areas then both indicate unsuitability. This may seem a very obvious point, but it is surprising how often it is overlooked.

It is practically essential to prepare a "mock-up" in some detail before embarking on the drafting of a complicated sieve map, for it is very difficult indeed to visualise the exact effect which will be produced by the addition of a particular kind of rendering to a map which already has several drawn on it, and if a mistaken decision is made amendment is usually impossible.

The main difficulties are to ensure that the spacing of the hatching or other rendering used for each factor shall be sufficiently close to show up on the smallest area to which it applies, yet not so close as to prevent other factors present being visible, to avoid any hatching or symbol coinciding with another and to make sure that no factor is shown so unobtrusively that it vanishes under the weight of others.

The first can be very awkward. It is absolutely essential that the spacing for the rendering of any particular factor shall be constant throughout the map and not, as can often be done with less complicated maps, moved about to suit the positions and shapes of detached areas (for to do this would make it impossible to solve the second difficulty), and it is difficult to position hatching so that every small detached area affected shall have a line running through it.

The second merely demands care. If a sub-divided geometrical grid is placed over the map and the spacing of each hatching, symbol etc., determined by reference to it, it should be easy to ensure that no clashes occur. They must not; even minor coincidences which one would not expect to have any appreciable effect are liable to impair the legibility which is so important and difficult to maintain.

The third cannot always be guarded against in advance but can usually be corrected by strengthening after the map has been completed. This may in fact be necessary for more than one factor.

Diagrams not in map form. These are principally of use in providing a visual summary of information which does not relate to land, or at least not to specific parcels of land, and so cannot be shown in map form, but which can be more readily assimilated if presented graphically. This in fact applies to nearly all quantitative statements except the simplest.

A simple example of the advantage of this form of presentation is to imagine a list of fifty parishes with the acreage of each beside it. If in written form it would, at best, require several careful readings before its principal implications could be appreciated. But if a bar of length proportionate to the acreage of each parish were substituted for or supplied in addition to the figures one could, almost at a glance, see which Parishes were the smallest and the largest and gain a very good idea of the mean size.

There is seldom any need to adopt a much more complicated technique than this though minor adaptations and elaborations may sometimes be helpful.

It remains only to mention subjects which suggest themselves as especially suitable for presentation in this way, such as comparisons of the total area occupied by each use in a town, employment structure, comparison of household structure with house sizes, proportion of dwellings in bad and very bad condition, areas of land required to relieve congestion and establish satisfactory open space standards, areas of land suitable and moderately suitable for general development. Fig. 30 is a graphic representation of the areas of land needed to implement Planning proposals of several kinds. Though in this case partially related to a map it is essentially an example of the technique under discussion.

Notations for Planning Maps

A very thorough and comprehensive code has been worked out over the years by the Ministry, now called the Ministry of Housing and Local Government, and is contained in the following circulars: Ministry of Town and Country Planning Circulars Nos. 40, 59 (as amended by Circular 70), 63 and 92. Three scales of map are used for most purposes: 1" to the mile for county surveys and proposals, 6" to the mile for town surveys and proposals and 1/2,500 for more detailed proposals such as supplementary town maps and comprehensive development area maps. The principle used is to treat the existing land use maps at each scale as reference points to show the conditions obtaining now as compared with the conditions which it is hoped will exist at the end of the plan period (usually 20 years). The latter are shown on development plan maps which might be described as prophetic land use maps—maps of the land use as it is hoped it will be in 20 years' time. This sounds reasonable, but it is in my view an unsatisfactory method, since proposed changes can only be understood for a particular piece of land by first identifying it and noting its use on the existing land use map and then turning to the development plan map to see whether the use is intended to change. This is not particularly convenient even in the case of one piece of land, but is practically impossible to get an overall understanding of the changes proposed by means of it.

A very much better method, which is shown in Fig. 31, is to treat the development plan map as a self-contained document and to show on it existing areas of use which it is intended to retain in an intense colour or hatching, and proposed new areas of each use in corresponding notations of decreased intensity. In practice this method works well, and it is very difficult to understand why it was not adopted by the Ministry. Its only defect is that, where a monochrome notation is used, it is still not possible where one building use is intended to be changed to another building use on a particular area of land, to tell what the present use is without reference to the existing land use map, but this difficulty applies to only a minority of proposals, whereas the official method applies to all. Where a coloured notation is used even this drawback disappears if a monochrome map showing existing land use is used as the base. The existing use appears in black and the proposed new use as a colour. This method can be used for Town Maps, Supplementary Town Maps, and Comprehensive Development Area Maps.

When one gets to the stage of detail at which individual buildings, small open spaces and the like have to be portrayed the problems of presentation become exceedingly difficult. It is easy enough to show an area as it is hoped it will be after development has been carried out, by means of a coloured or monochrome drawing prepared in ordinary architectural fashion, but this does not enable the pattern of land uses to be shown clearly if the design qualities of the proposals are also to be given full emphasis, nor does it enable a quick comparison to be made between the area as it is and as it will be, with particular reference to the buildings which will have to be demolished and to the extent to which the existing road system is retained.

As is explained elsewhere in this chapter, it is normally desirable that both the existing state of affairs and the proposed alterations should be shown on

the same drawing, but in this case this is hardly practicable. In the case of a residential area the best solution is probably to prepare one map as a straightforward zoning map and another of the normal architectural kind; where practicable it is helpful to prepare the former at a much smaller scale than the latter so that both can be mounted on the same piece of paper to facilitate comparison. In the case of the redevelopment of a town centre, a zoning map may or may not be useful, since zoning may be by means of horizontal rather than vertical divisions. A possible method is again to prepare two maps, one in normal architectural style, the other with new buildings, streets, etc., superimposed lightly over a base map showing existing conditions, the use of each new building being lettered upon it.

3.3. METHODS OF THREE DIMENSIONAL REPRESENTATION

Models

The cleverest rendering of maps can only produce an illusion of three-dimensional reality, since, to provide a blinding glimpse of the obvious, a map is only a flat sheet of paper. Quite crudely constructed three-dimensional models can give an altogether more vivid impression of the shape of an area than even the best of maps.

Models can be prepared to scales as widely varying as those of maps, and there are two principal kinds:

"Landscape" models

These aim at giving a more or less literal impression of a stretch of country, the only departure from accuracy being the exaggeration of differences in level, which are often almost imperceptible if this is not done. A point sometimes overlooked by the tyro model-maker is that though it might seem logical to exaggerate the heights of buildings, trees, and so on, in the same proportion as differences in the level of land, this, in fact, leads to disaster. Models of this kind are generally familiar; they are often extremely beautiful pieces of work, but when highly finished they are likely to be unduly expensive; almost equally good effects can be obtained by less elaborate means.

"Map" models

These consist simply of maps stuck to sheets of plywood or cardboard and placed on top of each other in layers, each successive layer including all the land above a given contour line. The final result is a stepped model which, while it lacks the literal realism of the other kinds, gives a startlingly clear picture of land relief. The 1/25,000 Ordnance maps (fully coloured edition) are particularly suitable for models of this kind. The method of leaving steps between successive contours, which is unavoidable when maps are used, is sometimes employed for the other type of model. It simplifies construction and emphasises relief, while it does not reduce realism nearly as much as might be expected.

It is often very effective to present a Town Map in model form, proposals being shown exactly as they would be on a map. This method can often make clear the reasons for the locations of the various uses better than any other.

There is one other kind of model which has recently been prepared. This consists of aerial photographs specially treated and stretched over a previously prepared surface shaped to the relief of the area. A model of this kind has obvious and great advantages but is clearly more suited to comparatively small scales, at which the lack of third dimensional treatment of buildings and trees does not matter.

The making of first-class models is a complicated art, but quite satisfactory ones can be made with very little experience. The basis for each is the superimposition of layers of plywood or other material and, except with the stepped type, these are covered with plasticine, plaster of Paris or modelling clay to reproduce the natural slopes of the land and to provide a base for the application of ground colour, buildings, trees, roads, hedges, etc.

Although, so far as I know, they have never been used for this purpose, it would be possible and very effective to employ for display to the public the kind of map sometimes found in hotel foyers, on which certain features consist of transparent material, the remainder of the map being opaque. Various selections of items can be thrown into prominence by switching on a series of small lamps placed behind the transparent areas, sometimes in different colours for different kinds of items. Obviously this kind of presentation would be costly and take a great deal of time to prepare, and would only be justified for a major piece of presentation.

Aerial Photographs

Vertical aerial photographs are now available in two principal forms :—

- (i) Series of small overlapping photographs which, when any two are looked at through a stereoscope, give a brilliant three-dimensional picture.
- (ii) Mosaics at a scale of 6" to one mile. These are printed on sheets based on National Grid squares. They cannot be used stereoscopically and lack the definition of the smaller photographs, but they are much more useful for general purposes. The smaller photographs, because of the very large number required to cover an area of any size, are somewhat confusing to use and are much more useful for studying detailed problems than for making broad appreciations.

Aerial photographs show the distribution and character of vegetation very clearly, while few maps show it at all except for woodlands and orchards.

Oblique aerial photographs are not so generally useful as vertical ones, since they are not true to scale, but they provide excellent panoramas and are much more readily understood by laymen than maps or vertical photographs.

Anaglyphs, though not yet in general use, are potentially of enormous value. They consist of two photographs of the same area which do not quite coincide, one printed in red, the other in blue, upon the same sheet of paper; when viewed through eyeglasses of plain glass or plastic, one red, the other blue, a three-dimensional effect is obtained almost equal to that given by a stereoscope used with ordinary aerial photographs, but covering a much

larger area. Thus, by issuing a pair of these inexpensive eyeglasses to each spectator, an anaglyph can effectively take the place of a model, but is more easily portable and also saves the large amount of laborious manual work which the preparation of a model requires.

Another development with exciting possibilities is the "artificial anaglyph", which consists of line drawings superimposed in exactly the same way as in the case of the photographic anaglyph. The best known example of this is the drawing prepared for the London County Council's proposals for the redevelopment of the South Bank, which gives a startlingly vivid impression of buildings, at the cost, one would suppose, of much less effort than that required to construct a model, and with the advantage of portability. It was published in the "Architect's Journal" of 21st January, 1954.

3.4. REPRODUCTION OF DRAWINGS

Much of the foregoing has been concerned with the technique of preparing drawings in a form suitable for reproduction, something must now be said about the various processes used for reproduction. The subject is a specialised one and it is beyond the scope of this book to attempt to treat it in detail. "Processes of Graphic Reproduction in Printing," by Harold Curwen (Faber and Faber) gives a clear and authoritative account.

A distinction must be made between the reproduction of drawings in limited numbers for office or committee use and production in quantity for publication. Quite different methods are used for these two purposes.

Reproduction in limited quantities

Three principal methods are available :

(i) *Dye-line prints*

These are produced by laying a transparent original over sensitised paper, exposing both to strong light and then immersing the sensitised paper in ammonia fumes. This process is quick and cheap, and the apparatus is sufficiently simple and inexpensive to be installed in a fairly large drawing office. The prints obtained have a dense but not perfectly black line; they can be coloured, but the paper is rather spongy, which makes first-class work difficult, and any erasures which may be necessary cannot be coloured over successfully; moreover, dye-line prints are not permanent; the lines gradually fade away, and this happens fairly quickly if prints are kept where they are exposed to strong light. A print pinned to a wall on which sunlight plays may, in the course of a year or two, be reduced to a blank sheet of paper. Nevertheless, for the quick reproduction of drawings required to be in use for only a short time, dye-line prints are extremely useful.

(ii) *True-to-scale prints*

These give prints with firm black lines indistinguishable from those hand drawn in Indian ink. They are produced by making on gelatine an impression of a special print taken from the original drawing; the gelatine surface is then inked, and the true-to-scale prints are obtained by placing sheets of paper one by one on the gelatine and passing a roller

over each. Any type of ordinary drawing paper may be used, so that hand colouring of the prints is much more satisfactory than for dye-line prints, and it is possible, though expensive, to have the prints made in a simple colour notation when the work involved is too great to be tackled by hand colouring in the drawing office, but the number of copies required is too small to justify the more elaborate processes about to be described. The true-to-scale process is rather more expensive than the dye-line one and can only be carried out by specially trained operators.

(iii) *Photographic prints*

These are simply photographs of drawings. They have several advantages not possessed by the dye-line and true-to-scale processes; the original need not be transparent and the prints need not be made to the same scale as the original. Colours on the original will appear as different tones of grey on the prints, and this can be deliberately used to advantage if the colours chosen are light and carefully contrasted; heavy colour, on the other hand, will print as black and obscure underlying detail.

Since the prints are made on photographic paper of various kinds, the satisfactory application of colour to them is difficult, although small areas of special significance can be picked out effectively in colour. The cost of this method varies considerably with the degree of enlargement or reduction required; on the whole it is rather more expensive than either of the two previous methods, but it has the advantage over them that, because of the different tones which can be produced, more complicated information can be shown clearly.

One extremely valuable application of the photographic process is its ability to reproduce an opaque original on transparent material. If such an original is of a complicated nature this may save a great deal of labour, since the reproduction can be altered as desired and subsequent prints taken by the dye-line or true-to-scale methods, and coloured by hand. In the absence of a photographically produced transparency many hours might have to be spent in making a tracing of the original.

Reproduction in quantity

Three methods are in general use; all three can be used for black and white or for colour work and need not be to the same scale as the original drawing.

(i) *Line blocks*

The original drawings are photographed and transferred to zinc blocks; a separate block must be made for each colour, and if many colours are used the cost is likely to be prohibitive. Some economy can be effected by combining primary colours to form secondary colours, e.g., areas to be coloured purple would be printed on both the blue and the red blocks. Some variety of tone can be obtained by placing finely hatched or dotted screens over those portions which it is desired to print lighter than the remainder; the pattern on the screen prints white and dilutes the colour. This process cannot be used to produce a continuous gradation of tones, but must be limited to two, or at most

three, tones of the same colour if they are to be distinct. Screens can also be used with black and white drawings to produce varying tones of grey.

(ii) *Half-tone blocks*

These are produced by an entirely different process. A continuous gradation of tones can be produced, and, in fact, a fairly close approximation to a complicated painting can be obtained. Since, however, the colours are built up from a vast number of blue, yellow, red and black dots of different sizes, spaced at varying intervals, it is impossible to obtain quite the sharpness and clarity given by a good line block, and, since planning maps seldom or never require continuous gradations of tone and colour, line blocks are generally to be preferred.

(iii) *Lithography*

The lithographic process gives results similar to, but not quite so sharp as those from line blocks, but where the area of the reproduction is to be greater than about one square foot lithography is cheaper.

It is highly desirable, before embarking on any programme of work involving the reproduction of planning maps by any of the three preceeding

methods, to consult the firm which is to make the blocks and plates. This should be done before the original drawings are made, as much expense can be saved and greatly improved results obtained by following expert advice on details. In the case of line blocks and reproduction by lithography in colour, it is necessary to supply the firm with the following :

- (1) A fully coloured print of the original drawing showing as precisely as possible the effect desired in the reproduction.
- (2) An uncoloured print showing the black lines (i.e., normally the base map) and any black areas only.
- (3) An overlay for each colour to be used with the areas over which that colour is to be printed, and those only, blacked in.

The above procedure avoids errors through misunderstanding and lightens the task of the printer.

It is obvious that where the original is to be reproduced to a different size the scale must be drawn on it and not stated in figures or as a representative fraction.

It is important that all lines on drawings to be reproduced should be firm and even, otherwise some lines or portions of them may not show up on the reproductions.

CHAPTER 4

REGIONAL PLANNING

4-1. INTRODUCTORY

REGIONAL PLANNING, as distinct from town or local Planning, involves primarily, as has been suggested in Chapter 1, the selection of some communities rather than others for change or growth, the general determination of locations for large non-urban uses, and the working out in general terms of a satisfactory transport network, rather than the specific selection of particular sites for particular uses. These processes can be described more fully as :

(1) The balancing of population and industry so that no daily mass movements of population to and from work and home are necessary.

(2) The improvement and rationalisation of transport routes to take the best advantage of existing facilities and to make the most effective use of the resources available for constructional improvements.

(3) The strengthening of the pattern of service centres in such a way as to secure for the great majority of the population concerned a reasonable accessibility to all grades of service.

(4) The location of large non-agricultural uses of land in the open country in such a way as positively to make the best use of natural resources. (Areas to be reserved for afforestation, reservoirs, areas of natural beauty and nature reserves are obvious examples of these) and, negatively, to secure that both these and unproductive uses such as military training grounds are placed so as to disrupt the agricultural pattern and the communications of the region as little as possible.

Regional Planning has nowhere been practised very fully. There have been innumerable advisory regional Plans, mostly quite incapable of fulfilment. There have been great experiments in regional development such as the Tennessee Valley Authority's, but these have either been unrelated to practical possibilities or else have had little connection with Planning as we have agreed to use the word, however impressive they may have been in other ways.

It would, in fact, probably only be possible to practise regional Planning fully in a community more politically advanced than any at present existing. The advance beyond present political and administrative standards might not have to be great, but it would have to be appreciable, since the full practice of regional Planning involves the complete abandonment of parochialism and rivalry between communities and the submission of land use problems to dispassionate public decision.

The Town and Country Planning Act of 1947 paved the way for regional Planning in this country, but it is beyond doubt that it is at the regional level

that Planning has so far had least success. Ten years after the coming into operation of the 1947 Act, fundamental problems of regional Planning which ought long since to have been settled and incorporated as parts of outline regional Plans are still a matter of acute controversy. Perhaps the most flagrant example of this is the question of where over-spill from the Manchester region should be accommodated. The latest of a series of public inquiries directed to decide this has only recently concluded. Indeed, in no part of the country has the pattern of future distribution of population and industry been determined to an acceptable degree of definiteness. The mere fact that decisions on such matters are still constantly being made the subject of public inquiry and fought out *de novo* is itself an indication that regional Planning by means of an orderly sequence of survey, preparation of outline Plans, consultation and finally the preparation of more detailed Plans is not taken seriously by the government.

I have said that the 1947 Act provided the basis for regional Planning, and this is true inasmuch as it made County Councils and County Borough Councils the local Planning authorities for the country and included provision for the Minister to set up Joint Boards to deal with the Planning of any two or more of these, where desirable. At the time of writing no Joint Boards have been formed except for the purpose of National Park administration. By no means all Counties are suitable units for regional Planning, even if the County Boroughs which they contain were included. When the County Boroughs are taken away and made independent Planning authorities the idea of regional Planning tends to become a mockery in the absence of Joint Boards.

A body called "The Association for Planning and Regional Development" has in recent years acquired a certain amount of prominence, and has urged not merely the need for physical Planning on a regional basis, but for virtually the whole complex of development, production and power to be so organised. I would not deny that there is much to commend this idea, but it does give rise to misunderstanding and confusion, for this would be economic planning on a very advanced scale. Effect could only be given to it in a very highly socialised state and would involve public ownership of industries and resources on a scale not so far contemplated in this country. It would, however, be quite wrong to suppose that in the absence of such revolutionary arrangements, regional Planning is impossible. Given public control over the use of the land, it is perfectly possible. We have in fact virtually all the necessary legislation to carry it out, but unfortunately we lack the will on the part of both central government and local government to do this.

Let us now turn to consideration of what constitutes a region, and what kind of area makes a satisfactory region for Planning purposes. A Region in a general sense is an area of land possessing characteristics which make it a readily identifiable entity; these characteristics may be physical, economic or social, and, in the case of a region with strongly marked identity, several are likely to apply it.

Regions may be of very different sizes, from enormous tracts of land like the Tennessee River Valley down to small but distinct units like the Vale of Evesham. What is needed for Planning purposes is an area which is large enough to enable substantial changes in land use to take place wholly within

its boundaries, yet which is small enough for its Planning problems to be comprehended as a whole.

A provincial metropolis such as Manchester or Birmingham and the towns, villages and area of open country which look to it for regional services, or a group of towns linked industrially, together with their rural hinterlands, such as the Potteries, comprise Planning regions with obvious advantages.

In less densely populated areas the service area of a local capital (defined later in this Chapter) would be suitable, and in fact corresponds roughly with the boundaries of some of the more rural English Counties.

As a matter of practical policy it is also desirable that the physical extent of a region should not be too great for it to be possible to reach all parts of it from its centre and to return to the centre within a day, leaving adequate time for work to be done, or, from another point of view, for it to be possible for the senior Planning staff to acquire sufficient knowledge of the whole region for each community in it to be something more than a mere name to them. These may possibly seem trifling factors, but they may make the crucial difference between efficient and understanding Planning work and a mere lifeless process of pattern-making.

The determination in detail of suitable boundaries for a Planning unit is a matter of considerable difficulty. Existing administrative boundaries are rarely ideal, but to ignore them entirely would create hopeless confusion. Professor Eva Taylor has suggested in the A.P.R.R. "Town and Country Planning Textbook" that after determining the general extent of the region the detailed boundary should be built up by using the outer parts of the boundaries of those parishes which lie on its periphery. She suggests that, although parish boundaries may cut across functional or geographical units, the short lengths of boundary involved for each individual parish should reduce such drawbacks to a minimum. Although Professor Taylor does not specifically link this method of fixing the boundary with the selection of a general area based upon the area of influence of a provincial metropolis or group of towns it would seem that the two could readily be combined and that the result would probably be a region possessing physical as well as economic and social unity. The boundaries of areas of influence generally follow marked physical features such as watersheds because of the obstacles to transport which these form. They are commonly respected to a considerable extent by parish boundaries.

Areas bounded by watersheds form satisfactory units as regards agricultural structure and drainage, although, where a watershed does not form a very pronounced barrier, social and economic influence may be little impeded.

It has already been said that existing administrative boundaries are rarely ideal for the purpose of Planning units, and this applies in varying degree to all grades of units from counties to parishes. The historical development of these units has been so profoundly influenced by strategic, ecclesiastical and political considerations that they have often lost all administrative convenience, and this has been accentuated by the immense changes in the distribution and areas of influence of centres of economic and social importance caused by the Industrial Revolution, the railways and the internal combustion engine.

Dr. Dudley Stamp and S. H. Beaver in "The British Isles" describe, for example, the way in which parishes in mediaeval times became unwieldy and irregular in shape because of the efforts of monasteries to increase their tithe income by combining several parishes surrounding a parish church belonging to a monastery.

They also contrast the counties, such as Kent, Sussex, Norfolk and Suffolk, which were originally kingdoms and which, on the whole, still form convenient units, with those, such as the Midland shires—Bedfordshire, Northamptonshire, Oxfordshire and so on—which originated later as arbitrary sub-divisions in the course of wars between Wessex and the Danes and which today are in many cases administratively unsatisfactory.

Later developments of local government units have often produced situations as anomalous as those which arose earlier. Perhaps the most striking example is the Manchester area, in which the County Borough of Manchester itself is a comparatively small part of the main built-up area, in which are included also the County Boroughs of Salford, Oldham and Stockport and the Boroughs of Stretford, Sale, Middleton, Prestwich and Eccles, together with several urban districts and parts of rural districts. To complete the chaos the county boundary between Lancashire and Cheshire runs through the midst of this area.

As noted earlier, the Town and Country Planning Act, 1947 theoretically enables any Planning region considered suitable to be created by the setting up by the Ministry of a Joint Board, which may embrace the whole or parts of any two or more counties and/or county boroughs, but, except for the purpose of administering National Parks, no Joint Boards at all have been established, not even for Lancashire, the numerous county boroughs within it, and Cheshire, or, at the other extreme, for Kent and Canterbury, the latter the smallest county borough in the country with a population of little more than 20,000.

It therefore appears that the notorious inability of local authorities to co-operate with each other has been officially considered impossible of cure. The Act also enables joint advisory planning committees to be established, but the prospect of these operating usefully is even dimmer than for executive Joint Boards.

Meanwhile, the administrative counties are in effect the Planning regions; where there are no county boroughs and where the counties are reasonably large and their boundaries follow those of geographical units, however approximately, they serve well enough, provided that a reasonable degree of collaboration takes place between adjoining authorities in respect of border areas which are on the wrong side of the boundary for Planning purposes. Even in the absence of such collaboration the co-ordinating functions of the regional offices of the Ministry of Housing and Local Government may suffice.

These regional offices, it should be noted, do not relate to regions in the sense in which the word has far been used in this chapter. The Ministry regions are merely groups of adjoining Local Planning Authorities, each capable of being administered, so far as the regional offices' functions are concerned, from a central point. These functions are supervisory and co-ordinating, and little concerned with Plan making.

4-2. THE DISTRIBUTION AND SIZES OF SETTLEMENTS

Just as many administrative units were created to meet circumstances which no longer exist, so the sizes, types and distribution of human settlements which exist today are largely the result of factors which have become altered in many ways.

The basic pattern. Human settlements form a pattern, albeit usually a highly irregular one, and are not arbitrarily scattered. The pattern can best be conceived as a primitive distribution of settlements, based upon food gathering and marketing, which has, in areas of dense population, been overlaid and distorted by a series of subsequent events.

There is a reason for the location of any human settlement. In primitive times, after the introduction of animal husbandry and crop cultivation had rendered possible a degree of specialisation and density of population greater than that attainable by the nomadic hunting tribes of the earliest men, prosperity and, indeed, survival must have depended directly upon local agricultural productivity to an extent which, in a modern urbanised and industrial country with highly developed transport resources, it is difficult to imagine fully.

Primitive settlements, therefore, were necessarily sited near fertile land so that it was physically possible to carry the fruits of the land to the community for its consumption. A sufficient, reliable and pure supply of water close at hand (a singularly difficult substance to transport in primitive times) was also essential, and, frequently, local conditions made it essential that the site should be capable of being readily defended. The population of any particular community was automatically limited by the number who could be fed from the produce of an area of land with a radius sufficiently small to enable the food to be gathered and brought to the settlement without the expenditure of more labour than could be spared from actual food production—a simpler version of our own problem of combining directly and indirectly productive labour in satisfactory proportions.

Much later, the improvement of communication routes, the introduction of wheeled transport and the centralisation of administration resulted in a pattern which, although based upon the simple original distribution of communities, was a great deal more complicated. The elements in this pattern, as it exists today in this country, may be summarised as follows:

(i) *Provincial capitals.* Towns such as Manchester, Birmingham and Bristol with populations of half a million or more. These provide services of many kinds for the inhabitants of a very large area. Characteristically, they possess a daily newspaper, a university, regional government offices, a stock exchange and a large general hospital, and are the nodes of main transport routes of all kinds, which make them easily accessible to the inhabitants of large areas.

(ii) *Local capitals.* These are often, but not always, county towns. They have, typically, populations of 50,000 upwards and possess urban facilities which, although they do not include those mentioned in the preceding paragraph, constitute a set of services complete except for those

which require an extremely large population for their support. Typical institutions not found in towns of a lower grade are a weekly newspaper circulating over a wide area, an assize court, a repertory theatre, an ancient grammar school and department stores. Many towns of this class are cathedral cities. They, too, are points of convergence for transport routes, and have often grown from market towns of very modest size because their geographical position made them specially accessible. They are found at widely varying intervals but are often spaced about 25 miles apart in regions of dense and fairly uniform population, conditions to which the average intervals given here for places of lower status apply.

(iii) *Fully-fledged towns.* These vary in size around 10,000 population and possess facilities meeting all but the occasional needs of the majority of people A. E. Smailes, in the A.P.R.R.'s "Town and Country Planning Textbook," has suggested that to qualify as a fully-fledged town a place must possess the following :

- Three or four banks.
- A secondary school.
- A cinema.
- A weekly newspaper.
- A hospital.

One would also expect to find professional and insurance offices, multiple shops such as Woolworths and Marks & Spencers and minor Government offices, while most such towns still have weekly stock and produce markets. These towns occur at intervals of about 15 miles.

(iv) *Urban villages or major rural centres.* These, typically, have a population of 1,500 or more; they do not normally possess a newspaper or a hospital, but have at least one bank, a fairly wide range of shops and usually a cinema and a secondary school. Frequently they are the headquarters of the administration of a rural district, and occur at intervals of about six miles.

(v) *Villages or minor rural centres.* Villages vary greatly in size, but, as used here, the term means a place with a church, a primary school and several shops. The population of such a "fully-fledged" village, which can appropriately be described as a minor rural centre, and has a social and economic influence extending some distance beyond its area of compact development, is often about 500 within such area, although the texture of villages varies greatly and is often so loose that it is hard to decide where the village proper ends and its more thinly populated hinterland begins. A common interval between villages is about four miles.

(iv) *Hamlets.* These are the smallest communities, and may consist of no more than a dozen households, together with a pub, a general store and sometimes a church. Occurring at intervals of two miles or so, they provide some very small degree of community services to those outside them and are, in this respect only, distinguishable from

(vii) *Isolated farmhouses and agricultural workers' cottages,* which are entirely dependent for services upon communities and which, together with the hamlets, contain the outside population served by the minor rural centres.

Places of each of these classes, except the last, possess some degree of centrality, i.e., are places to which people other than their inhabitants tend to converge; all, therefore, also possess some degree of nodality. They are almost invariably situated at or very near a junction of transport routes or change in means of transport—a cross roads, the point at which a river ceases to be navigable, or a harbour. This is true of even the smallest settlements, although the junction in such cases may be no more than that of a road with a much-used footpath.

It is by no means always easy to decide to which class any place belongs. Many places possess characteristics almost exactly intermediate between two of the grades listed above, and in the last resort it is the functions that they perform rather than their populations and visual characteristics which determine their positions in the scale. Many different classifications of the grades of place have been adopted by various authorities for different purposes, each with different sets of names; the above has been chosen as distinguishing those which for Planning purposes require to be treated distinctively.

The spatial distribution of centres of different grades tends to form a pattern the regularity of which is proportional to the simplicity and uniformity of the land area concerned. Thus, in an area without natural obstacles, of uniform fertility, with an evenly meshed transport network and hence a fairly even distribution of population, a pattern of remarkable regularity can be observed, provided that agriculture remains the dominant industry. Manufacturing industry, geographical obstacles, greatly varying fertility and irregular spacing or varying importance of traffic routes are all distorting factors which push and pull the pattern of settlements out of place until it may become indecipherable.

In numerous small areas and over most of Lincolnshire, Norfolk and Suffolk the pattern is still remarkably regular, but elsewhere distorting factors are extremely prevalent, so that the practical applicability of any theoretical statement regarding the distribution of communities must be limited unless some method can be found of measuring the distortion to be expected from any particular factor.

The most comprehensive and detailed theory has been produced by a German, Walter Christaller, whose work is based on a study of Southern Germany. For Christaller, what matters about a place is its centrality—the facilities it provides as a centre for services and the population which make use of these services. The resident population of any particular place may not be proportionate to its centrality, and thus a map of a region which indicates the population of each place may not show its true relative importance as a service centre. The pattern may only emerge clearly when the centrality has been measured and compared with that of other places, allowance being made for distortions. Nevertheless, Christaller sees some connection between centrality and resident population, since he assigns typical populations to places occupying distinctive positions in the hierarchy of communities.

As a yardstick Christaller takes the telephone, and derives the degree of centrality of a place—that is, the amount of the services it performs apart

from those relating to the needs of its own inhabitants, by means of the following formula:—

$$\text{Centrality of place} = \text{Number of telephones in place} - \left\{ \text{Number of inhabitants in place} \times \frac{\text{Number of telephones in area served by place}}{\text{number of inhabitants in area served by place}} \right\}$$

It is claimed that this formula enables the relative importance of places as service centres to be assessed, and thus for an optimum distribution of services to be determined.

Within the service area of a town with half a million inhabitants Christaller distinguishes six other grades of centre, with approximate populations in descending order of 100,000, 30,000, 10,000, 4,000, 2,000 and 1,000, the last-named being $4\frac{1}{2}$ miles apart.

In a regular theoretical system the service area of each place would be a perfect circle but these circles would intersect, indicating dual influence within the intersecting portions. Straight lines bisecting these intersecting areas would build up into a series of regular hexagons, as shown in Fig. 4, each hexagon representing the service area of a place. On this basis a place provides services of a given order for itself and for an area totalling one-third of the service areas of the places of next lower grade surrounding it. This series of regular hexagons necessarily involves a regular interval between neighbouring places (irrespective of their grade) and that the distances between places of equal grade increases $\sqrt{3}$ times for each successive upward step of grade. Thus, if the distance apart of all places irrespective of grade is $2\frac{1}{2}$ miles, places of equal status in the hierarchy will be, in ascending order, $2\frac{1}{2}$ miles, $4\frac{1}{2}$ miles, $7\frac{1}{2}$ miles, 13 miles, $22\frac{1}{2}$ miles, 39 miles and $67\frac{1}{2}$ miles apart. This does not agree exactly with the intervals suggested earlier in this chapter as being general in this country, which were rough averages for each grade for the country as a whole, but it is close.

Above the level of the local capital the theoretical grading breaks down so far as England is concerned, for the inhabitants of towns with a population of about 50,000 do not in fact normally look to towns of 100,000 for such central services as would not be found locally, but rely almost entirely upon a Provincial Capital. A probable reason for this is the very high degree of accessibility possessed by English Provincial Capitals, because of the close communication network, resulting in a greater concentration therein of central services than would take place in a theoretical system.

Even though it is not possible to give the Planner a formula for calculating the services which ought to be provided in each town and village, the hierarchic concept of settlements is essentially valid and important, and should be incorporated in all regional Planning proposals.

Before leaving this subject it will be valuable to compare the views of geographers regarding the spacing of towns. R. E. Dickenson, in "City, Region and Regionalism," refers to Christaller's figure of 7—9 kilometres ($4\frac{1}{2}$ to 6 miles) as the average distance apart of places, and states that this is "a basic determinant of the distribution of villages and small country towns all

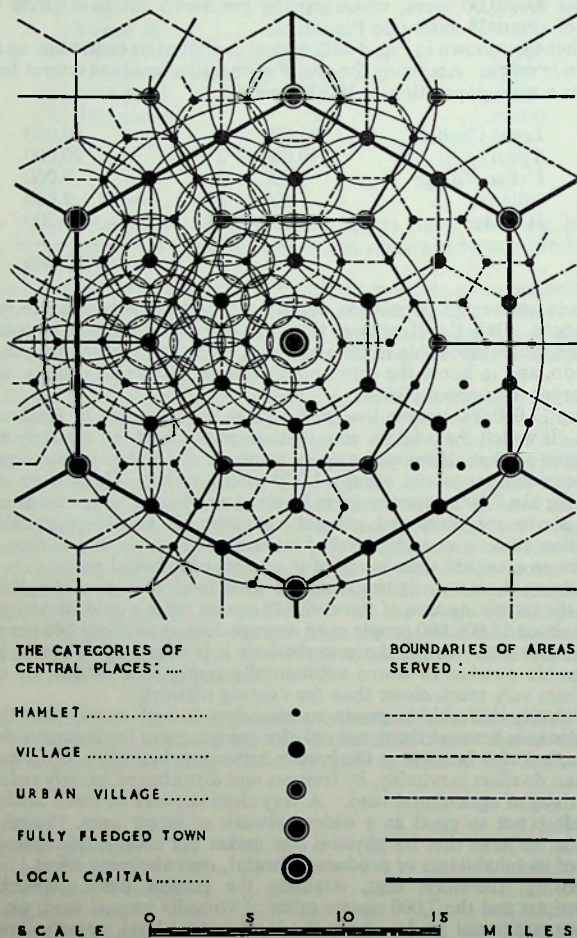


FIG. 4. Christaller's theory of service centres applied to English conditions.

over the Old World in closely settled areas." He points out that this spacing provides a local service area which takes about one hour to traverse from circumference to centre—i.e. $2\frac{1}{2}$ —3 miles.

Professor Eva Taylor, in the A.P.R.R. Textbook, gives the traditional distance apart of market towns as 10 to 12 miles in comparatively fertile low-land areas, an interval which made possible the carrying of produce or driving of stock to a morning market.

Dr. Dudley Stamp and E. H. Beaver, ("The British Isles") consider that in mediaeval England 7—10 miles was the normal distance apart of market towns, and that, as a result of the introduction of railways and the improvement of roads in the nineteenth century, fewer were required and approximately every other one decayed.

It is now necessary to consider what possible changes might take place in the sizes and distribution of settlements in this country in order to bring about a more satisfactory arrangement. A very large number of people in this country live in conditions which may be described as congested, and this congestion may involve any or all of four different sorts of deprivations :

Insufficient living space within and around the dwelling.

Inadequate facilities for games and other outdoor recreation within a reasonable distance of the home.

A lack of schools and/or adequate school sites.

Sheer physical inaccessibility of the open country.

Nevertheless, as I shall show, congestion is more a matter of maldistribution of development than of actual shortage of space even in this country which is very densely populated.

The following comparison of population densities in persons per square mile is interesting although such crude figures are apt to be misleading since they give no indication of the proportion of virtually uninhabitable land in each case.

| | | | |
|-------------------|-----|--------------------|-----|
| Belgium | 741 | India | 313 |
| England and Wales | 753 | Japan | 638 |
| Netherlands | 809 | Union of S. Africa | 27 |
| France | 200 | United States | 50 |
| W. Germany | 520 | Brazil | 19 |
| Iceland | 3 | Australia | 3 |
| China | 116 | New Zealand | 21 |

At a density of 15 persons per acre, it is possible, as will be explained in Chapter 7, to accommodate all urban land needs with a fair degree of spaciousness. This does not allow for large cemeteries, golf courses, sewage disposal and refuse disposal works, nor for areas for mineral working or service department land. Whatever the present amount of land used for these purposes may be it is likely to shrink. The increased practice of cremation, modern techniques of sewage and refuse disposal which involve less lavish use of land, probable eventual drastic reduction of service land

needs, the opportunity for restoring to productive use much of the land used for mineral working all support this view.

The land surface of England and Wales is 37,132,358 acres, or 58,019 sq. miles, within which live 44,667,000 people. If we call the population 45,000,000 for the sake of convenience, then the average population density is



FIG. 5. The present population of England and Wales, 45,000,000 in round figures, could be accommodated at 15 persons per acre within a circle with a radius of 38.6 miles. At an overall density of 15 persons per acre all urban land uses can be provided at comfortably spacious standards.

776 per square mile, and at 15 persons per acre they require for urban purposes 3,000,000 acres, which can be contained within a circle with a radius of about 38 miles (see Fig. 5).

The hexagon shown in Fig. 4 with a local capital at its centre has an area of 439 square miles. Assuming the size of each settlement is as set out below, it contains a total population of 100,700 people.

| | | | |
|---------------|-------------------|---|---------|
| Local Capital | $60,000 \times 1$ | = | 60,000 |
| Town | $10,000 \times 2$ | = | 20,000 |
| Urban Village | $1,500 \times 6$ | = | 9,000 |
| Village | 500×18 | = | 9,000 |
| Hamlet | 50×54 | = | 2,700 |
| <hr/> | | | |
| | | | 100,700 |

This gives an average population density of 229 persons per square mile for the hexagon. It is therefore clear that with our present level of population it would be quite impossible to do away with all cities, as some people would like to do, and to house the entire population in towns and villages, with no town larger than about 60,000.

About 17,000,000 people live in the great conurbations of England and Wales. If we left the total for conurbations at this level but redistributed the population so that all enjoyed a space standard of 15 persons per acre, then these conurbations would occupy 1,770 square miles. There is an area of something like 7,000 square miles in England and Wales, which because of its height above sea level and general character, is hardly practicable for occupation above a very low level of intensity and which, in any case, ought not to be so occupied since much of it consists of national parks.

Deducting these two figures from the total land acreage of England and Wales, the remaining area of some 49,249 square miles would be occupied by the remaining 28,000,000 people at an average density of about 568 per square mile, so that even outside the conurbations it is necessary either to have a considerable number of towns substantially larger than 60,000, or else to space them very much closer than the existing network.

It is clearly desirable to group communities in such a way that there is ample distance between them, not only for enjoyment of the countryside to be possible, but also because at the border between urban use and agricultural use urban dwellers inevitably, by trespass and disturbance, greatly reduce the productivity of agricultural land. A very close network of small settlements is therefore not so good as a wider network of larger ones, though none should be so large that its physical size makes the countryside inaccessible to any of its inhabitants or produces a brutal, overwhelming effect.

Supposing, therefore, that, retaining the present basic network, the conurbations and the 7,000 square miles of virtually unused land, we introduce two additional grades above the local capital level, namely, towns of 225,000 and towns of 500,000 at distances apart of 39 miles and $67\frac{1}{2}$ miles respectively, and increase the sizes of lower grade settlements as shown below. "Super-hexagons" are formed, each containing :

4-2

| | | | |
|----------------------|---------|---|---------|
| 1 Town at | 500,000 | = | 500,000 |
| 2 Towns at | 225,000 | = | 450,000 |
| 6 Towns at | 80,000 | = | 480,000 |
| 18 Towns at | 30,000 | = | 540,000 |
| 54 Urban Villages at | 3,000 | = | 162,000 |
| 162 Villages at | 1,000 | = | 162,000 |
| 487 Hamlets at | 50 | = | 24,300 |

Total 2,318,300

This "super-hexagon" occupies 3,949 square miles with a population density of almost 587 per square mile, which corresponds comfortably with the requirements.

It is quite clear therefore that it is physically possible to accommodate the whole population of the country at living standards which avoid the necessity of providing tall blocks of flats for any considerable portion of the population, without in any way violating a reasonable spatial relationship between town and country.

The truth behind these figures, which may seem incredible to anyone who travels about the main roads of the country and perceives the almost unbroken threads of development existing in many parts, and which will certainly make unpalatable reading for the more fanatical opponents of metropolitan decentralisation, is quite simply that in innumerable ways, some of which will be discussed later, prodigious quantities of land are either totally wasted or seriously under-utilised, thus producing local congestion within a general framework of low intensity of utilisation; and also that the actual distribution of development since the advent of the motor car has tended to assume a ribbon form so universally that one does indeed get the impression from a motor car that nearly all the whole of south-eastern England, at least, is built up. A view from the air, or even from a railway train, since development is not so strongly attracted to railway lines as to main roads, shows a truer picture.

To turn briefly from land requirements to land use facts, the land utilisation survey of the British Isles, carried out in the 1930s shows that at that time national land utilisation was divided roughly as follows for England and Wales:—

| | <i>Acres</i> |
|------------------------------------|--------------|
| Arable | 8,875,300 |
| Permanent Grass | 17,407,200 |
| Orchards | 260,500 |
| Forests and Woodland | 2,122,100 |
| Rough Grazing | 5,719,100 |
| Houses with Gardens | 1,560,800 |
| Agriculturally unproductive | 1,187,300 |

Total 37,132,300

"Agriculturally unproductive" includes all densely built-up areas as well as quarries, cemeteries etc., so that the combined totals of houses and gardens and agriculturally unproductive land, 2,748,100 acres, represents fairly closely the total area devoted to building uses. This indicates that even before the war there was only half a million acres less devoted to urban uses than is required now to accommodate the entire population at comfortable standards.

The land utilisation survey was not precise. It was carried out over a number of years and the figures for different areas relate to different dates. These figures have been brought up to date by R. H. Best in the "Town Planning Review" of October, 1957. He gives a thorough and extremely interesting account of work being carried on at Wye College. His estimate of the total amount of land in urban use in England and Wales in about 1950 (his figures, too, are not "as at" any particular date) is 3,601,908.

Best has also published a table giving an estimate of the complete Land Use of England and Wales in about 1950 in "The Chartered Surveyor" of June, 1958 :

| | <i>Acres</i> | | | | | |
|-------------------|--------------|-----|-----|-----|-----|------------------------|
| Arable | ... | ... | ... | ... | ... | 13,949,000 |
| Permanent Grass | ... | ... | ... | ... | ... | 10,496,000 |
| Rough Grazing | ... | ... | ... | ... | ... | 5,471,000 |
| Woodland | ... | ... | ... | ... | ... | 2,322,000 |
| Urban Development | ... | ... | ... | ... | ... | 3,602,000 |
| Unaccounted for | ... | ... | ... | ... | ... | 1,293,000 |
| | | | | | | <hr/> 37,133,000 <hr/> |

He suggests that most of the land unaccounted for arises from understatement of acreages of agricultural land in returns the Ministry of Agriculture by farmers.

Best concludes that "... the rate of turnover of agricultural land to urban development in England and Wales was greatest in the 1930's when the net annual diminution was over 60,000 acres. Since 1950 the net loss has, in contrast, been little over 35,000 acres per year. Information from a number of sources suggests that in the twenty years up to 1971 a total of about 600,000 acres is likely to be taken from farming use for urban purposes."

The urban area, Best emphasises, though far less extensive than is generally appreciated, has nevertheless grown even faster than is usually realised; but he points out that in spite of an ever diminishing area of farmland the efforts of both farmers and scientists have meant that a large expansion in food output has still been secured over the last two decades.

The discussion of possible ways in which to redistribute the population of England and Wales has so far been confined to what might be regarded as practicable if difficult actions. Let us now consider how the present population of the country might be distributed if it were possible to Plan in complete disregard of the present pattern of settlements, and if, in particular, there were no existing conurbations to contend with. The following table shows a possible arrangement :

Size of hexagon 3,949 sq. miles

| <i>Interval in miles</i> | <i>Size of Place</i> | <i>No.</i> | <i>Total Population</i> |
|------------------------------|--------------------------|------------|-----------------------------|
| 67½ | 500,000 | 1 | 500,000 |
| 39 | 250,000 | 2 | 500,000 |
| 22½ | 120,000 | 6 | 720,000 |
| 13 | 60,000 | 18 | 1,080,000 |
| 7½ | 10,000 | 54 | 540,000 |
| 4½ | 1,000 | 162 | 162,000 |
| Total | | | 3,502,000 |

Density (per sq. mile)—886.

Density required to accommodate 45 million on 51,019 sq. miles (58,019 – 7,000 unuseable) is 882 persons per sq. mile.

These figures are very remarkable. On the assumption that it would be possible to dispense both with houses in the open countryside and with hamlets (a not unreasonable assumption in the context of so radical a set of proposals) it would mean that on a journey through the countryside one would come across a human settlement only every 4½ miles, and that the smallest of these at the average density referred to throughout this chapter would occupy only some 66 acres, while the largest, the town of 500,00 people, would occupy 33,333 acres and be containable in a circle with a radius of very slightly more than four miles. The intervals between these large towns would be nearly 60 miles, and England and Wales would contain about 13 of these hexagons.

The lesson to be drawn from this wholly abstract illustration is clearly that a properly organised distribution of settlements of various sizes at proper density standards can be attained in a large variety of ways. In particular, it seems to show that there is no limit to the extent of metropolitan decentralisation possible in terms of space for communities. It follows that the menace to the conservation of agricultural land and to the maintenance of sufficiently large stretches of open countryside arises not from the density at which new development or redevelopment may take place, but rather from the present strong tendency for development to take place on virgin sites, which eats up both agricultural land and countryside, and to leave under-developed areas of land unchanged.

There is a danger that this may eventually lead to an absurd situation in which there exist at the same time both substantial numbers of central area flats at an inhumanly high density, and vast stretches of under-developed land unsatisfactory by reason of lack of compactness, so rendering a proper provision of central services difficult or impossible. The ultimate possibility is that when housing demands are saturated, as they may well be within a comparatively few years, intensity of occupation will fall away in both these categories of development and become concentrated in the remaining kind, that is to say, the well-knit areas of moderate density well served with social facilities. If this happens, we shall have embraced both of two alternative

evils: we shall have wasted a great deal of capital on building high, dense buildings which do not meet human needs, and we shall also have spoiled the countryside of Britain by dispersing dwelling over it. It should be one of the chief aims of Planning to avert this disaster.

It is important to get the problem of conservation of agricultural land into proper proportion. Whatever may be the total amount of land at present devoted to urban uses, a comprehensive Planning policy could, in the long run, result in bringing it back to a total of 3 million acres, and much land could, during this long-term process, be brought back into agricultural use. It is certainly of great importance that no agricultural land should unnecessarily be taken and converted to other uses, but it would be quite wrong to have regard to alarmists views, and stint ourselves of land for urban purposes for this reason. As explained in more detail in Chapter 16, there is strong evidence for believing that, incredible though it may seem, reasonably low density housing is capable of producing more food from the gardens than is medium quality farmland, and that within certain limits the reduction of housing density more than proportionately increases the output of garden food.

It may be challenged whether, in our present national circumstances, the maintenance of a high level of agricultural production is of very great importance, having regard to the certainty that we shall always in part be dependent upon imported foodstuffs, and to the probability of increased efficiency in the disposition of land uses and communication routes, at some cost to agricultural land, resulting in increased industrial efficiency, and hence a greater volume of exports with which food can be paid for. It is still more open to question whether the mere maintenance of as large an acreage of agricultural land as possible is of great importance. The opportunities for improving the output of agricultural land by the investment of capital on buildings, drainage and fertilisation are very great, and, as has been pointed out by many authorities, the capital at present devoted to special subsidies for high density flat development would, if devoted to the improvement of agricultural land, result in immensely greater increases of food production than any possible increase from the small amount of agricultural land saved by building at very high densities.

4.3. FACTORS IN REGIONAL PLANNING

Balancing Population and Industry. The balancing of population and industry is a complex process depending on many different factors; Planning action alone cannot do more than create conditions which render the achievement of a satisfactory degree of balance physically possible and reasonably probable.

Just as, in the long run, the imports of a country must be balanced by its exports, so must those of a town. Unless a town, in which is included the areas directly dependent upon it, exports valuable products, whether these consist of minerals, manufactured goods, food or professional and business skill, its inhabitants will be in much the same position as those of the mythical islanders who earned their livings by taking in each other's washing. In other words, they will be able to consume only the produce of their own

area, a state of affairs inconceivable in this country, where the ordinary daily menu includes items from all parts of the world.

The goods and services which a town exports are its basic industry, the return derived from which enables it to obtain the goods and services which it cannot itself produce.

The complicated and often indirect ways in which a town exports commodities, through the medium of numerous private concerns and individuals and with the intervention of middlemen and distributing agencies, need not be pursued, being a matter of elementary general economics, but a word of explanation regarding the meaning of the somewhat misleading word "export" may be useful. "Export", in the sense in which it is here used, means *providing* goods and services to the outside world; it does not necessarily mean that they are *sent* outside.

The tourist trade enjoyed by an historic city such as Chester—the money spent in the city by those who come to look at its historic monuments and buildings—is an export. The entertainment provided by Brighton is an export. The income derived by a solicitor from the written advice which he sends to a client in another part of the country is derived from export. Even the income of the London businessman who lives in a country town is part of that town's export income.

Service industry, on the other hand, is that which is carried on for the benefit of the inhabitants of the place in which it is situated—the "taking in of washing"—and, curiously, laundries are a very characteristic service industry.

In Planning a region, therefore, it is essential not to Plan for a state of affairs in which there is insufficient basic industry in any town to balance its necessary imports. Such Planning cannot, of course, be done in detail; as already indicated, economic transactions are so diverse and multifarious that it would, in any case, be beyond human power to do so; what it comes down to in practical terms is that the Plan must allocate sufficient land for uses which will provide jobs for all or most of the inhabitants of each town, otherwise they will have either to go elsewhere to live or work elsewhere.

It must also be remembered that people will not permanently live in places where public services and social facilities are defective, where the general habits of life prevailing are displeasing to them or where there is not a reasonably assured prospect of congenial work, although in conditions of acute housing stringency they may go almost anywhere to get a house.

Distribution of development and Services The purpose of a regional Plan is not merely the balancing of quantities of industry and population; it involves, too, an appropriate spatial arrangement of these and of all community services.

This spatial distribution may take the form of creating settlements, such as new towns, or of altering the size and/or the status within the hierarchy of service centres of existing settlements. There are two aspects of this which must especially be borne in mind.

The population of a place, as has previously been suggested, is not necessarily proportionate to the amount of service it performs for its tributary

area, particularly in the lower grades of settlement. An alteration in the status of such a place may therefore be effected by the addition or subtraction of Service institutions without a corresponding change of population. Nevertheless, the greater the nucleated population of a place the greater the services it can perform and the more economically secure will be its Service institutions, since, although various changes of circumstances may result in the population of parts of the tributary area transferring their allegiance to other supply centres, the population within the place itself is hardly likely, for reasons of physical convenience, to do this to any serious extent. Save in quite exceptional circumstances it is therefore desirable that nucleated populations in various places should be roughly proportional in numbers to the services rendered by the place.

Ebenezer Howard's famous satellite Garden City theory, enunciated in the closing years of the nineteenth century, remains extraordinarily valid and relevant. There is an even greater need today to stop peripheral development of large towns, with its inevitable accompaniments of increased traffic congestion and reduced accessibility to open spaces and countryside for urban dwellers, and to locate the new buildings required in connection with an increase of population (or the buildings which, as the result of redevelopment at a lower density, cannot be replaced on the same site) elsewhere than on the edge of the built-up area.

Both on social and economic grounds it is difficult to carry out such development in a completely different part of the country, while the establishment of purely residential units physically detached from the large town merely perpetuates traffic congestion, increases the weariness and expense of the journey to work and results in the creation of communities which are mere dormitories, and lack vitality, since the busy hum of creative work is largely absent from them.

The remaining solution is the self-contained satellite town, physically separate from the large town and preferably at least twenty miles distant from it, to discourage it from becoming a mere suburb, yet within the same region. Such a town can provide employment for all its inhabitants, yet its industries can readily use the same sources of raw materials, sell to the same markets, and utilise the same links with other industries and with the business and financial organisation of the parent town as if they were located within it.

Socially, its inhabitants, who will mostly have come from the large town, will not be entirely severed by time and expense of travelling from their old haunts and will not be uprooted and transplanted to an area whose regional culture is strange and uncongenial. Married women will still be able occasionally to go home to mother for the day.

It is upon this theory that present day Planning policy is largely based.

The theory, like most, is not without practical difficulties and objections. A removal, even to so small a distance as twenty miles, still involves a greater disturbance than is altogether congenial to people so deeply embedded in a particular district as are many of the British. The feat of regulating the construction programmes for residential, industrial and service buildings so as to avoid grave temporary unbalance of employment and social facilities at

each stage is a difficult one and, since there is probably no site in Great Britain suitable for a new town which is not the site of some existing settlement, however small, the impact of thousands of urban industrial workers and the necessary buildings to accommodate them is apt to be resented by the existing inhabitants—a fact demonstrated by the somewhat undignified protests made against most of the new towns so far launched.

A new town may either be built on a virtually clear site or in the form of a substantial enlargement of an existing town; there is no clear-cut distinction between the two, and all intermediate stages are possible. Probably the least dislocation will be caused by comparatively small expansions of a fairly large number of existing towns so as to secure the degree of decentralisation and recentralisation of population and industry necessary for the large town, but there are obvious limits to this. The spacing of existing towns is already fairly close, and the number which can be used for recentralisation is limited if the new population is not to be moved too far from its original home, so that such a policy would involve a considerable danger of creating or intensifying the conditions pertaining to a conurbation, in which a number of existing towns are virtually fused into one large town—a state of affairs which planned decentralisation is specifically intended to prevent.

There is of course another and quite different way of looking at the problem which is well exemplified by two articles by Ruth Glass published in "The Times" on 18th and 19th June, 1956. She drew attention to the fact that almost one million commuters came into Central London daily and that the distances they travelled were increasing. She suggested that, as a significant decrease of London's employment appeared to her to be impracticable, a further decline in population would have serious consequences. London, she concluded, needs more homes, not fewer jobs.

The growth of large cities to mammoth proportions is a world-wide phenomenon. N. Moffatt stated in a broadcast talk reported in "The Listener" of 27th March, 1958, that the Japanese expect that Tokio will have grown to a population of 26½ million by 1975. Gordon Stephenson's Plan for Perth accepts a total population for the metropolitan region of 1,400,000 in fifty years' time as compared with a present population of 400,000 and provides for an unbroken urban area about 17 miles by 11 miles. Many other examples of the same tendency could be given.

It is difficult to see why such a fate for metropolitan dwellers should be tamely accepted. It is essentially futile to raise standards of living on paper by creating enormous complexes for production, distribution and exchange if the cost is to be a hellish physical environment for many millions of people. It is in any case difficult to believe that so huge a mass as 26½ million people could in fact come together in one city without some form of biological disaster ensuing.

Mrs. Glass in the articles referred to did not, it is worth noting, give any reasons for her disbelief in the practicability of decentralisation.

Peter Self, in "Cities in Flood" takes a very different and, in my opinion, more balanced view of the prospects of securing metropolitan decentralisation, given adequate powers and the use of sufficient incentives. His thesis, written primarily from the point of view of an economist, is that the

official policy of decentralisation is both practicable and right, but needs to be applied with much greater determination.

E. G. S. Elliott, in "Outwards or Upwards" in the Journal of the Town Planning Institute of March, 1958, has given reasons for doubting the validity of Ruth Glass's assumption and gave interesting figures concerning the economics of centralisation and decentralisation of homes irrespective of the possibility of decentralising employment. He came to the conclusion that, taking into account all forms of expenditure, including that on travel, the cost of decentralising up to a distance of 30 miles would be less than building tall blocks of flats in the centre.

There are really three possibilities to consider :

(1) The orthodox policy, already briefly described, of decentralising homes and employment from metropolitan areas to the greatest practicable extent.

(2) The abandonment of decentralisation and the concentration of metropolitan population in dwellings at very high density. It is sometimes claimed that this would reduce the problems of transport, but a more dubious proposition has seldom been advanced. Such a policy, rigorously pursued over a whole metropolitan area would be more likely to render the provision of a workable transport system physically impossible, and to replace bus queues by lift queues.

(3) The acceptance of metropolitan growth at densities acceptable to the population by means of continued peripheral development. The consequences of this could only be spread out hell instead of the compressed hell to be expected from (2).

It will help to make clearer the spatial consequences of these different policies if we consider them in relation to London and in the same terms as those used to discuss the national distribution of population earlier in this chapter.

Taking the population of Greater London to be $8\frac{1}{2}$ million, then, if all new development and redevelopment, without decentralisation, were carried out at the rate of 15 persons per urban acre, these $8\frac{1}{2}$ million people would eventually occupy 885 square miles, containable in a circle with a radius of just under 17 miles. If the centre of this circle were at Charing Cross the circumference would pass near Watford, Hoddesdon, Redhill, Leatherhead and Uxbridge. None of these names are reminiscent of remote rural life, but a solid mass of urban development of this size (even including the 7 acres per 1,000 of public open spaces included in the 15 per acre standard) would be horrifying. At present, although most of the land within this circle is more or less urbanised it nevertheless contains very large areas of open and agricultural country, much of which is concealed from main roads by the ribbon development lining them.

Let us now turn to the results of compressing the metropolis. The 15 per acre standard is based on a net population density of 40 persons per acre. If the space standards for industry, businesses, open space and schools, which are based on requirements which are not so flexible as those for dwellings, are maintained and the average net residential density is raised to 200 persons per

acre, then the overall urban density rises from 15 persons per acre to about $21\frac{1}{2}$ persons per acre.

Our $8\frac{1}{2}$ million unfortunate cliff dwellers would then be living in a metropolis covering about 618 square miles, containable in a circle with a radius of 14 miles. A reduction of 3 miles in the radius of a metropolis is, though not negligible, a colossal price to pay for confining the entire population in multi-storey flats. With very rigorous economy in land use it is possible, at least on paper, to develop at an overall urban density of about 21 persons per acre, even with a net residential density of 40 persons per acre (see Chapter 7, page 84). If, with these tighter non-residential standards the net residential density is raised to 200 persons per acre, the overall urban density is raised to about 36 persons per acre and the radius of the circle necessary to contain $8\frac{1}{2}$ million people is about 10.8 miles. Whichever set of non-residential standards is used the increase of residential density from 40 to 200 per acre contracts the radius of the built-up metropolitan area by about 3 miles.

The very small effect on overall urban size brought about even by drastic changes of residential density seems to me to constitute the final, answerable refutation of the fairy palaces School of Planning. This subject is further dealt with in Chapter 16; for the moment, it will be enough to add that the non-residential elements in the 15 per acre urban space standard, based as they are on a town of 60,000 *might* be slightly excessive in terms of a metropolis of $8\frac{1}{2}$ million, by reason of the greater flexibility in land use which undoubtedly goes with size. But when one considers, on the other hand, the large areas for entertainment, civil, ecclesiastical and regal pomp, docks, huge transport terminals etc., which simply do not arise in the case of a smaller town and which in the case of London serve a far larger population even than that of Greater London it seems unlikely that this is so.

Changes in the Status of the Communities. Changes of status within the hierarchy of settlements may theoretically involve either upgrading or downgrading.

Places down to and including urban villages are mostly so well established and have survived so many vicissitudes over a long period that it is improbable that a development Plan would seek to down grade any of them, while it will often be appropriate to provide for the relocation of population in such a way that one or more of them is upgraded. Similarly, it will often be appropriate to transform a number of villages into urban villages.

On the other hand, it may well be desirable to provide in the development plan that some towns which are well balanced industrially or which have a deficiency of employment shall not increase in size because an increase would involve the provision, concurrently, of additional central services, which would fit better into the regional pattern if located elsewhere, or because the limited amount of increased population to be expected in the region needs to be located elsewhere to remedy labour deficiencies.

Requirements of this nature are seldom appreciated by the elected representatives of places which it is not intended to expand, even though the amount of land suitable for building is insufficient to accommodate the overspill

resulting from the redevelopment of existing areas of congested development. It is this failure to rise above parochialism which makes the existence of a strong and independent Local Planning Authority particularly necessary.

When one considers the smaller villages and the hamlets, the need for changes of status becomes more frequent. Most of these settlements arose when walking and horse-riding were the only means of travelling, and long before the days of conveying water and power by pipe or wire. These services and the motor bus have effected a transformation in the pattern of settlements required in rural communities in order to take full advantage of them. On the one hand, the motor bus makes it much less necessary for social and marketing facilities above the level of daily needs to be made available within walking distance of every home, and makes it possible for higher services to be provided in a more effective form than previously in a smaller number of larger communities. On the other hand, to make the provision of piped and wired services economically possible a very much closer texture is required within the individual rural community than exists in many cases.

This leads to the inescapable conclusion that development Plans should in most areas provide for fewer but more compact rural settlements than exist at present, and this is a view which has received the general support of informed opinion from the publication of the Scott Report in 1942 onwards.

Other factors in the pattern. Consideration must now be given to the various forms of development which have been superimposed on the ancient pattern of agricultural communities.

Manufacturing industry. First among these is manufacturing industry, which is entirely independent of the agricultural pattern. During the industrial revolution industry became established in quantity wherever access to raw materials, power or transport facilities gave it the best opportunity of flourishing.

The story of the mushroom growth of the industrial towns of Britain, the crowding of houses, their intermixture with factories, the lack of open spaces and of provision for social services, will probably be familiar to every reader, and need not be repeated here. Although some of the deficiencies have gradually been made up, the typical industrial town, which frequently has not evolved from an ancient original of any considerable size—Middlesbrough, for instance—presents Planning problems which are different in kind from those associated with towns rooted in the past and which have grown steadily and organically through the centuries. This problem is greatest in the case of the fused masses of industrial towns known as conurbations, such as Greater Manchester, Greater Birmingham and the West Riding Woollen towns. Sheer lack of space and the vast quantity of capital investment in existing buildings precludes rapid solutions in their cases; the best that can be done immediately is usually to set standards which fall short of but approach as closely as possible to the satisfactory.

Modern transport developments. The coming of the railways after 1830 resulted in unprecedented growth of many towns and villages on sites which had previously been occupied by only the smallest of settlements. These

places owed their growth to the advantages attaching to the increased nodality afforded them by the railway, which increased their importance as centres of exchange, junction points (Crewe is a fine example of this) or suburban centres for the more well-to-do inhabitants of near-by industrial towns. It must be remembered that the fourfold increase in the population of the country between 1811 and 1911 enabled these increases to take place without corresponding decreases occurring in other places.

Most places created or greatly enlarged by the influence of the railways have, by now, been fairly well absorbed into the pattern of communities and cause no special Planning problems because they always possessed latent advantages of position which the railway enabled them to realise. But this emphatically does not apply to many of the places created by inter-war growth in the use of the internal combustion engine.

The motor-bus virtually destroyed the limiting factor of time which had hitherto kept most settlements reasonably compact, whatever their other defects might have been, and which had confined suburban growth to places accessible to railways. Desire to escape from the grimy and congested inner urban areas and to get into close contact with green fields caused many to make enormous sacrifices of time and money, and they were enthusiastically aided by the speculative builder, who, since public services had usually been installed in the main roads leading out of town, tended to confine his operations to the land fronting them, and so created the ribbon development which now forms the approaches to most towns. The depressed state of agriculture, leading to the ready sale of land for building purposes and the growth of the building societies, which financed much of this development, were strong contributory factors.

For those owning motor cars the choice was much wider. They could live on pleasant sites near or adjoining villages or in houses, either isolated or built in groups, in the open countryside. In the home counties, particularly, this kind of development, combined with the urban ribbons, has resulted in vast, amorphous areas thinly scattered with houses but with no development of other kinds. These are neither town, village nor countryside; possess many of the disadvantages of each with but few of the advantages.

It is virtually impossible for most of these areas to be welded into coherent communities and their decay and eventual disappearance is the best that can be hoped for (see Chapter 19).

Another kind of development less directly connected with the development of transport, although to a considerable extent dependent on it, is the shack town which is commonly associated with large industrial towns. This has generally been created by the demand of low-paid workers who have been financially unable to escape into ribbon development or sporadic country development, but who have nevertheless determined somehow to live in the country. Houses in these areas are often of the "home-made" kind, including converted sports pavilions, Nissen huts and flimsy structures which resemble houses, but comply with no by-laws. Drainage is usually extremely sketchy—a cesspool with an overflow, or non-existent. Water is obtained from various sources.

Little blame rests on the people who took advantage of the opportunity to

acquire the poor man's version of a country seat, but what is almost incredible is that local authorities should not have devised more effective means to stop development which breaks all laws of hygiene. When it is extensive and particularly when, as sometimes happens, it is on a water-gathering ground, it is a constant danger to public health, and, in any case, it causes wasteful expenditure of public money in the provision of services such as postal deliveries, cesspool emptying (when cesspools exist), the visits of doctors, midwives, and ambulances and many others, because of the scattered nature of the development and the frequently impassable nature of the roads. These circumstances, conversely, often make it extremely difficult for children to attend school regularly.

Most of these objections also apply to the more ordinary kind of sporadic development in rural areas, which, in addition, necessitates a good deal of road improvement which would otherwise be unnecessary, but in this case, local authorities were powerless before the existence of adequate Planning legislation.

Service establishments. These take many different forms. They may be long established and be the dominant form of development in a town, as in Aldershot, in which case it is necessary to adjust the whole form of development of the town to their needs, or they may merely be extensive tracts of open country in which practice is given in using live ammunition and manoeuvring vehicles, in which case consideration must be given to the extent to which the agricultural economy is affected by the loss of farmland and to the way in which the rural settlement pattern needs to be adjusted to changed circumstances.

Establishments which often present the most difficult planning problems are barracks and airfields in rural areas, with married quarters attached. Although the rations officially supplied, the N.A.A.F.I., and camp concerts provide a partial substitute for shops and social services in such places, their existence is likely to cause a substantial increase in the use, and sometimes a need for increased provision, of shopping and recreational facilities in near-by towns and major rural centres. The spectacle of wives and children trailing along the road to the village a mile or more away emphasises the absurdity of not locating living accommodation for all except operational personnel within existing communities, and it is regrettable that Planning Authorities have not had more success in securing this.

Other uses of large areas of open land. Just as firing ranges may upset the balance of a rural settlement pattern, so, of course, may many other less sterile uses: the inundation of agricultural land to make a reservoir for the water supply of a city, the surface working of minerals, an open-air zoo like Whipsnade, or a civil airport may all take up areas of land extensive enough to upset the agricultural economy in their vicinity.

The extractive or quarrying industries are, in many cases, very large land users and the Planning problems they create are great. Minerals lie where nature has placed them, and in the case of many minerals the supply, or at least that part of it which it is economically possible to use, is less than the demand. Although quarrying is frequently open to grave objections, including the destruction of natural beauty, the use of fertile agricultural land

and of land which is needed for building or other urban uses, it is frequently necessary in the national interest to override these objections and permit quarrying, subject to whatever safeguards can be imposed with regard to manner of working and restoration of the land to a state in which, after the minerals have been extracted, it can be put to other purposes.

Residential and resort towns. A good many towns have little connection with agricultural or manufacturing industry but cater almost entirely for holiday-makers, the retired, or those who work in other towns.

Resort towns are, in effect, industrial towns of a very special kind, and have their own peculiar needs as regards the allocation of land for various purposes; they range from garish joy-towns, catering for those who want short holidays crowded with incident, to sedate places, like Bournemouth or Folkestone in which quieter attractions are popular and in which the requirements of holiday-makers and of the retired coincide happily, so that such towns perform a dual function. Much the same applies to inland towns

favoured by the retired, such as Tunbridge Wells and Malvern, although the holiday-making side of these places is usually smaller proportionately than in the case of the seaside towns.

The problems of most of these towns is to maintain the characteristics upon which their income depends and yet to provide their working resident populations with sufficiently varied occupations, so avoiding the disadvantages associated with single industry towns, which are vulnerable to unemployment in the event of depression in the single industry, and lack opportunity for the employment of varied talents. A particular difficulty is the seasonal unemployment which inevitably afflicts towns which depend principally upon summer holiday-makers.

With this brief exploration of the complexities of Regional Planning concluded we turn to the practical investigations required for the formulation of Regional Planning proposals.

CHAPTER 5

REGIONAL SURVEYS

5-1. PRELIMINARY

THE TERM SURVEY, as used in connection with Town and Country Planning, means the collection, interpretation, arrangement, combination, and presentation in the most readily understood form of all the information likely to influence the proposals to be included in a Development Plan. Survey is necessary for any Plan, from a national Plan right down to investigation leading to the selection of a housing site, although naturally the subject-matter for inquiry and the degree of detail entered into vary widely with different kinds of Plan.

The need for preliminary investigation before preparing Plans has long been recognised, Patrick Geddes being known everywhere as a pioneer in this field. His untiring reiteration of the need for such survey did much to stimulate the many excellent county and regional surveys, usually including also advisory Plans, carried out during the inter-war period. These helped to make clear the principles upon which land for different uses should be selected and the ways in which wise action could alter for the better the numerous ways in which the constituent units of the pattern of human settlements affect each other; but the lack of any sufficient legislation to enable the obviously desirable action to which they pointed to be taken lent them an air of unreality. If anyone had tried to prepare a town or rural Planning scheme in such a way as to give effect to the findings of a regional survey it would have been practically impossible to do so without incurring liability for stupendous amounts of compensation, even if the approval of the Ministry of Health (then responsible for Planning) could have been obtained for any really effective proposals.

Nevertheless, these surveys and advisory Plans, often beautifully presented, provided to a great extent the stimulus for the necessary legislative sanction for effective Planning.

Those preparing statutory Planning schemes under the 1932 Act did *some* survey. It usually took the form of travelling about the area concerned and making notes of such relevant factors as took the eye: an area of marsh, a fine view, a patch of unsightly development or a group of trees worth preserving. In this way the trained eye could rapidly give the skilled brain an excellent general impression of the salient characteristics of an area. This impression was reinforced by the study of ordnance maps and of the local authority's maps showing the distribution of sewers and gas, water and electricity mains.

On the whole, however, this rough and ready survey existed chiefly in the planner's mind, reinforced by a few cryptic notes on dog-eared ordnance sheets, and was not available to his successor if promotion, retirement or

death called him elsewhere. The survey lacked any coherent visible expression which could be produced at will to assist in discussion or to confound opposition.

It is true that the Ministry of Health did require a sort of survey map to be submitted with the Planning scheme, which showed broad divisions of land use, areas sewered and provided with piped water supply, and areas to which these services could readily be extended, but there was, as far as one recalls, no suggestion that the plan should have been based upon this information.

The present system of Planning survey, on the other hand, is, or ought to be, used, *first*, to give the requisite information upon which to base proposals; *second*, to provide members of the Local Planning Authority, and subsequently the Ministry, with information upon which to judge the merits of the proposals; and, *third*, to convince owners and intending developers of the rightness of the proposals to which they are being asked to conform.

This new attitude towards survey emerged gradually towards the end of the war. There was a tendency at this time somewhat to exaggerate the desirable scope and degree of detail of Planning survey. In some quarters it was virtually suggested that a really thorough survey practically removed the necessity of doing any Planning; the survey would reveal unmistakably what proposals were required. This, of course, is nonsense, but, on the other hand, it is certain that a really well prepared and presented survey will often indicate in general terms the solutions to various problems which, without such aid, might never have been arrived at, and would, at best, have necessitated a much greater amount of thought and worry than that involved in preparing the survey.

Before and shortly after the passing of the 1947 Act many admirable Planning surveys had been prepared by various agencies in anticipation of the need for such work as a basis for real land Planning. In their very different ways the surveys for Hereford, Kent, Lancashire and East Suffolk among the counties, and of Manchester and Middlesbrough among the towns, are especially interesting. It is noteworthy that some of them enter into much greater detail in some directions than is required for statutory purposes, but that, on the other hand, none of them entirely covers statutory requirements.

It is essential before embarking on a Planning survey to be as definite as possible about the terms of reference: the problems about which information is required and the *kind* of action possible to solve them. Thus, although the ideal method of conducting a survey might be to collect and correlate as much information as possible about every subject which could possibly have a bearing upon the Planning of the area concerned, time and expense both render such a course impracticable. It is necessary to confine the survey to such subjects as commonsense and experience suggest are likely to assist in formulating proposals for which there is legislative sanction.

This statement needs to be qualified. An all-out investigation into the problems of land use without regard to the immediate practicability of translating its findings into action may itself eventually help to stimulate the necessary legislation, or an investigation of some special aspect may reveal the need for more drastic and far-reaching proposals than are possible within the existing framework.

There is also a great but insufficiently recognised need for all information dealing with social and economic subjects which relates to land uses, population growth and migration, employment, etc., to be obtained and interpreted in such a way as to be capable of being directly compared in order to form a continuous body of knowledge throughout many fields.

No hard and fast line can be drawn; there are several subjects the direct relevance of which to statutory Planning the average Planner might have difficulty under cross-examination in establishing, yet without a knowledge of which he would feel himself lacking the essential information. The best example of this is the general history of the Planning area (as distinct from such special aspects of it as the preservation of ancient monuments and buildings of historical or special architectural interest), which may have practically no discernible influence upon the Development Plan, but of which no planner would care to be ignorant because of the general *understanding* of the area, an understanding which might almost be called emotional, which a knowledge of it gives.

In these chapters, in order to keep treatment of the subject to a reasonable length, I have confined myself almost entirely to those subjects which have a direct bearing upon the preparation of the Development Plan.

The scales of the maps used, the subject-matter and the degree of detail entered into necessarily differ between various surveys. We cannot here be very greatly concerned with national surveys, which lie outside the scope of this book, but mention must be made of the series of 1/625,000 maps (about 10 miles to 1 inch) prepared under the auspices of the Ministry of Local Government and Planning, which constitute a sort of vague beginning to an outline National Plan.

Regional surveys can be prepared to larger scales than a national survey, and town surveys to still larger scales. Some subjects may have to be dealt with on all three levels, and one of the 1/625,000 series illustrates this point. The Land Utilisation Survey is a generalisation from the 1 inch to 1 mile series published by the Land Utilisation of Great Britain, and this in turn, is taken from 6 inches to 1 mile field sheets. The first two of these also illustrate well the principle that where the same subject-matter is dealt with on different scales the notation on each should, as far as possible, be the same, or, where this is not possible or appropriate, sufficiently similar for the connection between the two to be immediately apparent. (The 6 inches to 1 mile field sheets were not coloured, the use of each parcel being noted in writing). Both the 1/625,000 and the 1 inch to 1 mile Land Utilisation Maps can, incidentally, be commended as among the most effective and beautiful maps ever made. Looking at the 1/625,000 map one probably gets as vivid a picture as is possible of the contrasting patterns of land use in different parts of the country.

Regional Surveys can conveniently be divided into three broad classes, those dealing with:—

- (a) *Physical factors*
- (b) *Physical and economic factors*
- (c) *Social and economic factors.*

5-2. PHYSICAL FACTORS

(1) Topography

This may be presented in the form of a model, map or anaglyph. Models and anaglyphs have already been mentioned in Chapter 3. If it is decided to construct a model the most suitable method for this purpose will probably be to make a stepped model using fully coloured 1 inch to 1 mile or 1/25,000 Ordnance sheets in their published form without any rendering. The vertical interval of the steps must to some extent be dependent upon the time available and the skill of the model makers; the smaller the vertical interval the more detailed and accurate will be the picture given. The vertical scale should be some three or four times greater than the horizontal scale in order to emphasise the relief adequately.

If a map is used the base map should be No. IIb (see page 25), and if it is to be rendered in colours it is necessary to work out some simple gradation. It is usual to colour the lowest land lightly and higher land progressively darker, but there is no particular reason why the opposite should not be done.

A monochrome notation is hardly suitable for a large contour map, but can be employed very effectively on a small generalised map on which only broad differences of level are indicated.

(2) Physically difficult land

This survey is sometimes presented in combination with the preceding one, but is much better dealt with separately. On it is shown all the land which, because of its characteristics, is relatively or absolutely physically unsuitable for the purpose of large-scale building development, the land subject to each particular factor being distinguished. Among the characteristics tending to make land physically unsuitable for such development are:—

(i) *Excessive height*

In this country the climatic conditions of land within a few hundred feet of sea level are generally mild, but above a certain height they become severe; this severity increases progressively until a second point is reached above which development is undesirable.

The selection of actual datum heights is necessarily somewhat arbitrary, since the change of severity is gradual and not abrupt. Seven hundred feet and one thousand five hundred feet have been suggested as suitable heights in average circumstances, but these circumstances are subject to considerable local variation; the critical heights, for example, may be considerably lower where the aspect of the land is northerly. It is improbable in the extreme that anyone would be likely accidentally to select a site for a new town in this country 2,000 feet above sea level because no survey map picking out high land was available! Nevertheless, abroad, in mountainous country, such information conveniently plotted might be very helpful, and even here it can occasionally have its uses.

(ii) *Excessive slope*

Steeply sloping land, however delightful it may be for the siting of a few houses, is unfavourable for large-scale development in several ways:—

- (a) The costs of roads and buildings are increased because of the amount of excavation and building-up required.
- (b) Traffic danger is increased.
- (c) Flexibility in the siting of buildings is decreased.
- (d) Playing fields and other uses requiring flat sites may have to be located inconveniently far from the population they serve.

It is, of course, unlikely that the whole of a site under consideration for extensive development will consist of steeply sloping land, and, in weighing up its merits from this point of view, it is necessary to consider both the proportion of steeply sloping land to the whole and its distribution; it will usually be possible to accept a higher proportion of steeply sloping land if it consists of a few fairly large masses than if it is, on the one hand, confined to one very large area, or, on the other hand, is greatly fragmented. In either of these two latter cases flexibility of siting will be very greatly reduced and, where there is great fragmentation, areas of comparatively level land surrounded by steeply sloping land may be virtually undevelopable either because they are too small in extent or because access and drainage are rendered unduly difficult and costly.

As with height, it is useful to distinguish two degrees of steepness: first, the point at which slope begins to create difficulties, and, second, the point at which those difficulties become so severe as to preclude development unless no better alternative site can be found.

Again, a more or less arbitrary choice has to be made of critical slopes for purposes of differentiation, and opinions on this subject vary considerably. In the West Midlands Group's "English County" 1 in 10 and 1 in $7\frac{1}{2}$ are chosen, while in the A.P.R.R. Textbook on Planning 1 in 20 and 1 in 7 are suggested. The particular slopes chosen must necessarily depend to a great extent on the characteristics of the area being surveyed, and it is important to choose ones which will effectively distinguish between suitable and unsuitable sites. For instance, in an area where a large proportion of the land was at gradients of between 1 in 9 and 1 in 8, the choice of 1 in 10 and 1 in $7\frac{1}{2}$ would clearly be inappropriate since, on this basis, there would be very little differentiation between somewhat unsuitable and very unsuitable land.

There are one or two points to be borne in mind when working out areas of excessive slope. The actual process is simple enough, though tedious. Suppose that areas with a slope in excess of 1 in 10 are being plotted; a distance, at the scale of the map being used, equal to ten times the vertical interval between contours is marked on a piece of paper and, by measuring with this, all the land between successive contours, along those portions of their length where they are closer together than this distance, can be shaded or otherwise marked off; the result, even after smoothing out curves, is usually a series of shapes of great complexity, and at the Regional scale there is no objection if these are generalised somewhat. But, since the 1/25,000 maps give the most detailed contour information likely to be available over an area of any considerable size, and since information concerning steep land is a survey item which recurs at all scales of survey, it is certain that at some stage, even if a smaller scale is being used for the regional survey, the areas of

steep slope will have to be plotted on the 1/25,000 scale for the sake of the extra detail. It will save labour if they are worked out on the 1/25,000 map in the first instance and transferred to the smaller scale map.

(iii) *Unfavourable Aspect*

Land which slopes in a generally northerly direction suffers from a diminution in the intensity of the sunlight falling upon it, from exposure to cold winds and from a reduction in the potential number of hours of sunshine which it enjoys. The incidence of this disadvantage is difficult to determine because any precise definition of the areas affected is complicated in areas of intricate topography by the overshadowing of some areas by others in a manner which is not simply related to aspect. However, experiment suggests that where the general slope of land is in a direction between north-west and north-east and is also steeper than one in ten the disadvantageous effects are significant. The areas of unfavourable aspect shown in "English County" appear to have been plotted on this basis. If this standard is used, plotting is, of course, extremely simple and consists merely of selecting those portions of the areas with slopes in excess of one in ten which have a general direction between north-west and north-east. It is unnecessary to exclude small areas within a hill feature which have some other aspect, since they are likely to be so overshadowed by other land that they enjoy little or no advantage compared with the remainder.

(iv) *Land liable to flooding or waterlogging*

It hardly seems necessary to point out the disadvantages of such land, which include physical inconvenience, costly construction and unhealthiness. It is, however, a matter of some difficulty both to determine the standard which should be used to determine the degree of flooding or waterlogging which constitutes a serious disadvantage to development, and, when this has been done, to define the areas affected. Gordon Payne, in his Survey and Plan for Gloucestershire, quotes the opinion of the Medical Officer of Health for Gloucester that development is undesirable where the level of underground water rises to within 10ft. of the surface, a standard which at first sight seems extremely severe. Under the Land Drainage Act of 1932, drainage authorities have to determine areas within which occupiers are liable for drainage rates. These areas usually comprise land not more than 8ft. higher than the highest known flood level. There is a fairly close relation between these figures, and, since the extent of these areas is defined on maps and is, therefore, readily ascertainable, there is considerable advantage in using them.

However, some caution must be exercised. It may be appropriate to exclude such areas from consideration as New Town sites, for example, but it would obviously be futile to attempt to prevent all building within them, since many towns and their potential development areas lie wholly within such limits. The flood areas on which drainage authorities base their rating areas are, too, open to some suspicion, since, in many places, they are prepared from "oldest inhabitant" information. The incidence of flooding is by no means an unchanging factor; the activities of drainage authorities may reduce the affected area considerably. Building development may itself

operate to reduce the incidence of flooding; the provision of road channels and surface water sewers enables rainwater falling on the area to be taken away rapidly without causing flooding.

Enough has perhaps been said to indicate that great care is necessary in basing Planning decisions upon survey data. At the regional scale the drainage authorities' flood and rating areas, suitably differentiated, may provide a useful guide; for more detailed purposes they will need to be supplemented by recent local information, aerial photographs, study of the distribution of moisture-loving plant species, and any other available source. It goes without saying that land permanently covered with water should also be shown on the map.

(v) *Large excavated areas and spoil heaps*

These will have to be very large to be significant at the Regional scale, but where very large ones exist they should be shown. Normally the sides of excavations will be too steep for road access to be practicable, and this alone rules them out as sites for development.

(vi) *Land liable to subsidence*

The land above underground mineral workings is often unstable and liable to subsidence to an extent likely to cause serious damage to buildings and services. It is often a matter of great difficulty to ascertain the boundaries of areas liable to subsidence, but it is clearly of importance to do this as accurately as possible.

(vii) *Large areas of land used for the disposal of sewage or refuse*

These are self-evidently unsuitable for building development, at least until such a use has ceased for a considerable number of years. It may be asked why these particular public uses should be selected for attention on this map out of the large number of other such uses which preclude general development. The factor which distinguishes them is that they are virtually the only ones which adversely affect the land itself from the point of view of prospective building development; obstacles to development in the case of other public uses are the importance of the existing use, the cost of changing its location, the legal complexities involved in making a change of use or straightforward reluctance on the part of the owning authority.

(3) **Geology**

This is a subject which provides the Planner mainly with background information; that is to say, although the geology of the region has the most profound effect upon its agriculture, landscape and local building materials, and although no Planner can afford to be without a knowledge of it, the occasions upon which he will have to go right back to fundamental geological facts upon which to base any particular Planning decision are likely to be rare; more commonly, knowledge of the geology of the area will tell him what problems to expect.

Published geological maps need expert interpretation, for the categories shown on them are sometimes misleading. For example, the Weald Clay though much of it is in fact clay, contains also sizeable areas of sandstone which are not shown on the map. The scale and detail of available geological

maps varies greatly in different areas; much valuable geological information was destroyed during the war.

The most useful geological map for planning purposes is a lithological map, which shows merely the distribution of rock types—sand, clay, chalk, etc., and does not concern itself with the particular geological formation to which each belongs. Once more it must be emphasised that it is essential to obtain expert advice when preparing such a map.

Those unacquainted with geological maps must be careful to distinguish between solid maps and drift maps. The former show only the underlying bedrock, while the latter show any overlying strata deposited on the bedrock by the action of wind and water. Even the drift maps do not show the character of the topsoil, normally no more than a foot or so in depth, which is mixed with humus (decaying organic matter) and may vary in character much more widely than the drift of which the subsoil is composed. However, important superficial deposits, such as sand, gravel and brickearth, are shown by means of symbols where they overlie drift of a different composition, the latter being identified by colour.

(4) Landscape

Few would deny the need to preserve unspoiled the beauty of as much as possible of our countryside, and the attainment of this object can be substantially assisted by the collection and presentation of appropriate survey data. In order to understand the basis upon which the Survey should be carried out it is necessary to make certain fundamental assumptions; opinions may differ about what these should be, but the following appear to me to be reasonable:

(i) The countryside is not a museum-piece but a vital part of the national life, much of it the workshop of the agricultural industry; it would be foolish, in any area, to attempt to prevent any economically or socially essential development, but much can be done to steer it to sites where it will do the least harm to the landscape.

(ii) Notable landscape is of three principal kinds:

- (a) That which forms part of a stretch of magnificent scenery visible from one or more viewpoints.
- (b) Landscape which, because of its topography, vegetation pattern, and, sometimes, design, is exceptionally beautiful, but does not give rise to any particularly sweeping or dramatic views.
- (c) Small-scale landscape of superlative quality—small, wooded valleys, strips adjoining rivers and streams and so on.

Of these (a) may cover the best part of several counties and it would obviously be both absurd and impracticable to attempt to prevent development in the whole of such an area. Apart from anything else, it is quite likely that much of it will have no great intrinsic beauty at close quarters. The important thing is to prohibit all except the most essential agricultural development in the immediate vicinity of the viewpoints themselves and the foreground of the view. The depth of foreground which it is practicable to

preserve against development will vary considerably, but it seems reasonable to assume that any development more than two miles from a viewpoint will, if reasonably well designed, be sufficiently softened by distance for its injury to the landscape to be greatly minimised. Such a policy will also protect the skyline, and the slopes leading to it, of the feature on which the viewpoint is situated, which may well form as fine a landscape feature from the lowlands as the lowlands do when seen from the viewpoint.

As regards (b) it is important that only the very finest landscape should be selected for complete preservation; so much English countryside is extremely attractive that there is a temptation to try to preserve all of it against development—a policy bound to be self-defeating. Within such areas as are eventually selected the objects will be to prevent any large-scale development and to control small amounts of development with special care. The selection of these areas must necessarily depend upon personal opinion, and it is desirable to make use of the agreed choice of several people.

As regards (c) it will, of course, be necessary to prevent development within the area concerned and of any land close to and visible from it.

It is appropriate to include on *the landscape map* the areas proposed as nature reserves or areas of special scientific interest under the National Parks and Access to the Countryside Act, 1949. In addition to Nature Reserves proper there are certain geological monuments—examples of rare or specially interesting geological formations which are exposed to view and which should also be included.

It is also convenient to indicate areas of woodland which it is considered should be preserved on account of their appearance. The factors governing the selection of these are discussed in Chapter 19.

During the war the Admiralty developed an instrument called a Landfall Projector, which enables the area of land visible from any particular spot to be plotted from a contour map. I have no knowledge of the speed at which this work can be carried out, but if it is not excessively slow it is obvious that this instrument could be of great value in determining areas for preservation. It could also be of value in finding unobtrusive sites for inevitable intrusions in the landscape.

An account of the instrument and its operations is given in the Journal of the Town Planning Institute for March-April, 1947.

5-3. PHYSICAL-ECONOMIC FACTORS

(1) Agricultural value

Maintenance of the welfare of the agricultural industry by preventing the loss to agriculture of as much good land and as many productive farm units as possible is an important Planning aim. The factors involved are numerous and complicated, and it is not possible entirely to separate the regional and local aspects of the matter.

Eight factors which affect the agricultural value of a given area of land as compared to other agricultural land are of special importance. They are as follows:—

- (i) The inherent fertility of the land due to the composition of its soil.

- (ii) The local climate; differences of height and aspect and the prevalence of frost pockets may cause wide changes in the productivity of land within quite a small area.
- (iii) The prevalence of steep slopes and broken land.
- (iv) The thoroughness with which the land can be drained.
- (v) The condition of the soil, buildings and fixed appliances as the result of the skill of the farmer and the amount of money spent on maintenance and improvement.
- (vi) The extent to which the farm is a satisfactory unit as regards size, shape, internal communications, position, size and design of buildings, balanced variety of soil types within the holding, etc. When considering, on the local Planning level, the relative importance of retaining in agricultural use several small areas of land each comprising only part of a farm unit, the intricacy of the factors involved becomes very great. Two fields of approximately equal acreage forming parts of one unit may have totally different degrees of importance to the economy of the unit; the loss of one may be negligible, that of the other crippling.
- (vii) The position of the land in relation to transport routes and markets.
- (viii) The availability of sufficient agricultural labour, including the various specialist workers required.

The Planner, unless he is also an agricultural expert, must inevitably be ignorant of the relative weight to be attached to these numerous factors, and in any case their collection, interpretation and mapping would be a task of impossible magnitude for a Local Planning Authority to carry out in connection with a Planning survey.

It has nevertheless been suggested that, within areas in which substantial development is possible, the relative agricultural value of each parcel of land should be assessed according to the incidence of all the relevant factors, such as those mentioned above, so that an intelligent selection could be made to minimise the agricultural loss caused by development. Clearly such a survey would be a very large task, would have to be carried out by agriculturists, and would need frequent revision, since the incidence of some of the factors may change fairly rapidly. Since the Planner is concerned with relatively long-term values, it would be best from his point of view for such an assessment to be confined to the comparatively unchanging factors.

For the purposes of regional survey two maps will probably suffice; a map showing, broadly, *areas of relative fertility* and a *farm unit map*. The former, in the absence of more detailed information, can be based upon the classification adopted for the 1/625,000 Land Classification map. This map is itself at too small a scale for accurate plotting to a larger scale to be made from it, but the same information, plotted to a larger scale, can be obtained from the Ministry of Agriculture. This survey distinguishes ten different categories of land, which is excessive for the purposes of the map under discussion. They may be boiled down to areas of good, moderate and poor farmland and mixtures of these. In "English County" it is suggested that categories 1 to 4 may be regarded as good quality land, categories 5

and 6 as moderate land, and categories 7 to 10 as poor land. These categories are based upon depth and character of soil and drainage.

Unfortunately, the information given by the Land Classification Survey is so general that for Planning purposes it is sometimes misleading; there may be widely varying types of land within an area shown as falling within a single category and some areas are shown as combinations of two or more different categories, which makes the information even more general. It is not uncommon for very large areas of excellent land to exist within an area shown as of moderate quality and vice versa. More detailed surveys have been carried out by various bodies in some parts of the country, and where one is available and its reliability assured it should be used. Even so, it is likely that in parts of the survey area there will be such wide variation of quality within a small area that a mixture will have to be indicated on the map.

The Farm Unit map should distinguish clearly the boundaries of each holding, a farm unit or holding being an area occupied and managed as one unit. Where a holding is severed into two or more portions they should be linked by ties, since this map is normally so complicated that merely to indicate the different portions in the same notation will be insufficient to make clear the relationship between them. The position of the principal group of farm buildings, or farm headquarters, of each unit should be shown by a symbol, since the loss of these buildings or their severance from the remainder of the holding will often be much more serious than the loss of even a substantial part of the land.

Although knowledge of the Farm Unit pattern is most important in the vicinity of town and villages, where development involving the loss of land to agriculture is most likely to arise, proposals for main roads, airfields, W.D. training ground, etc., may affect land anywhere in the region, and it is well worth while to do the small amount of extra work involved in mapping the farm unit boundaries over the whole area.

The Ministry of Agriculture has full information regarding farm unit boundaries, although this is not everywhere completely up to date. Unfortunately, access to this information is uncertain. It was originally obtained from the Ministry of Agriculture from farmers on the understanding that it would be treated as confidential. The extent to which officers of the Ministry of Agriculture regard the passing of this information to the Local Planning Authority as being consistent with this undertaking varies in different parts of the country, notwithstanding that it is an item in the official notation for land use maps. It would not, of course, be a task of insuperable difficulty, though it would be one of some magnitude, for the Local Planning Authority itself to acquire the necessary information by local investigation on the part of its officers, though to do this when the information has already been mapped by the Ministry of Agriculture would involve a quite indefensible duplication of work.

(2) Mineral resources and water-gathering grounds

For information on these subjects, which can appropriately be shown on the same map, the planner is very much dependent upon information from outside sources. The location of commercially valuable minerals is often not

precisely known, still less the areas in which they exist in an economically workable form or in the requisite degree of purity. It is the responsibility of the Ministry of Housing and Local Government to supply Local Planning Authorities with information on these subjects, but additional information by any other reliable source is likely to prove useful.

Generally speaking, it is desirable to map all areas in which it is reasonably certain that economically workable minerals exist, with notes in as much detail as possible regarding the type, quality, depth below surface and depth of mineral-bearing formations. The presence of such minerals is not, of course, an absolute bar to development; the need for them to be worked has to be balanced against the need for the land to be used for other purposes, but, since the supply of many minerals is less than the demand, it is preferable to locate other forms of land use elsewhere if this is possible.

Water may be regarded as a special kind of mineral; in some circumstances it is collected into usable concentrations from the surface of the ground, sometimes it is obtained from underground. In both cases there is need for protection from land uses liable to pollute the water supply. In the case of underground supply an area surrounding the points at which the supply is tapped, depending in size upon the geological structure of the area and the amount of water extracted, will need protection. The necessary precautions may not prevent development, but may consist merely in the prohibition of development not connected to a sewer or likely to result in harmful substances percolating into the ground.

There seems to be no agreement about the degree of protection which is required for surface supply. Current practice varies greatly.

As regards potential future sources of supply, such as that which would be required for a new town, the investigation needed is too specialised and arduous a task to be included in an ordinary regional Planning survey, but should be undertaken as a special project. The number of sites suitable on other grounds for a new town is likely to be extremely small, and water can be conveyed for considerable distances by pipe, so that the nearness of sources of water supply is not necessarily a severely limiting factor.

(3) Areas provided with public services

A map should be prepared to show the road frontages which are served by sewers, gas, electricity and/or water. The best way to show the information is to colour a strip of arbitrary width on either side of the road served, varying the colour according to the degree of completeness of the services existing. Thus, lengths of road in which there are a sewer, a water main and gas or electricity mains (gas and electricity may be regarded as alternatives for domestic purposes) might be coloured brown, lengths with a water main and gas or electricity but no sewer, orange, and lengths with a water main only, blue. There may be a few lengths of road without water but with a gas or electricity main, and these should be indicated separately.

Care should be taken only to show tappable lengths of main in the fashion indicated above, any trunk lines not capable of being tapped for purposes of small-scale development being shown separately. The position of sewage disposal works, power stations, gas works and reservoirs should be shown.

Another map should indicate areas which cannot be economically served by the existing sewerage system so far as they can be determined at this stage, and on it should also be shown any land which, because of insufficient head of water, cannot economically be provided with water supply. It is hardly practicable to indicate areas which cannot be served by gas or electricity, since almost the only consideration which applies is distance from existing sources of supply, and the distance beyond which the provision of a new service becomes uneconomical varies according to the amount of development to be served by it.

The principal purpose of these maps is to help decide the areas in which small new settlements, comparatively minor additions to existing towns, additions to villages and such isolated rural dwellings as may have to be permitted can suitably be located. The location of new towns and major extensions to existing towns, which may require the constructions of new sewage-disposal works and reservoirs and of trunk mains, cannot be determined in this way; their service requirements need special investigation (as suggested when dealing with sources of water supply under (2) above), which can most easily be undertaken after possible alternative sites suitable on general planning grounds have been determined.

(4) Transport

The facts concerning transport facilities which directly concern regional Planning and upon which Planning action can be taken are comparatively few. Many regional surveys contain large quantities of complicated data on the subject, which, interesting though they may be and valuable to those concerned with organising public transport services, mainly consist of information which the Planner himself cannot turn to account.

Two maps will normally suffice for the purpose of regional survey:

(a) *Existing Facilities*: a map showing as clearly as possible the existing network of roads, railways, canals and navigable rivers and the position of civil airfields. Much of this information is shown on Ordnance maps, and all that needs to be done is to reproduce it on a map in such a way as to emphasise strongly the pattern of the transport system and the relationship of one form of route with another, so that the points at which improvements are needed can be clearly seen. A useful refinement is to differentiate between roads in respect, not of their Ministry of Transport classification, but of the width of their carriageway; obstacles such as low bridges and sharp bends should be noted. The depths of canals and navigable rivers might well be shown.

(b) *Traffic Density*: a map showing, by bands of varying widths, the amount of traffic using various main roads. Differentiation between week-day and weekend traffic, industrial or commercial traffic, and private cars, and cycles is also helpful.

5.4. SOCIAL-ECONOMIC FACTORS

(1) Areas of influence of towns and villages

"The hierarchy of service centres" is a phrase often used to describe the pattern of human settlements, which, from metropolis down to hamlet, all provide services of a commercial, social, and often educational character, not

only for their own inhabitants but for those of a surrounding area as described in Chapter 4. One of the principal objects of Regional Planning is to work out the positions and amounts of the additional supply services which should be provided in order to attain a well-graded hierarchy, but the Planner is not in a position to influence directly the choice of settlements by banks, insurance companies, shopkeepers and other suppliers of services; on the other hand, he can at least have a large say in determining which of the smaller villages are chosen for the establishment of new primary schools and which of the larger villages for secondary schools, and, since supply services depend upon the existence of a central population as well as of a surrounding one, he can exercise a powerful indirect influence by providing for the greatest increases of population in those communities in which the greatest increase of supply services is needed to secure the optimum pattern.

Information regarding the existing pattern can be presented in a variety of ways and with greatly varying degrees of detail. For example, it would be theoretically possible to map the areas supplied by every important service in every town and village, and from these to plot the mean area of influence of every such place. However, it is neither practicable nor necessary to go into such detail; in practice the selection of one specially important service, with perhaps the addition of another as a check, is found to be satisfactory.

Shopping is a particularly suitable service for this purpose. There are some shopping facilities in almost every place where there is a demand for them because the provision of rudimentary shopping facilities requires the outlay of comparatively little expenditure—no more than a counter across the front room of a house in extreme cases—and is in such cases only a supplementary source of income. Prospective shopkeepers are not, therefore, likely to be greatly deterred by the possibility of demand proving insufficient to support a business, and the situation is not greatly complicated by the vagaries of choice of capital investment. Also, shopping can be divided into three fairly distinct types :

- (a) The daily, or at any rate very frequent, purchase of small articles such as loaves of bread, milk, cigarettes, and meat. These have necessarily to be purchased from close at hand.
- (b) Purchases made weekly or at other fairly regular intervals of articles not obtainable, or of which there is not a wide choice, at small local shops. These purchases involve, for those living in the country and in the outer residential areas of towns, shopping expeditions which are often combined with a visit to the cinema, "window shopping," changing library books, and visits to multiple stores.
- (c) Occasional important purchases, some of which may be made only once or twice in a lifetime, carpets, suites of furniture and pianos, for example, and others, such as tableware and crockery, clothes and television sets, which, although they may be made more often, involve laying out sums of money sufficiently large to make this something of an event. The prudent purchaser may decide that he can only obtain a sufficiently wide choice in the large and numerous shops of the local capital.

By determining and mapping the shopping centres used by every community in the region for each of these three purposes a good picture can be obtained of the areas of influence of the larger centres. The necessary information is not particularly difficult or laborious to obtain. It would be sufficient to question a number of housewives in each community. They would not necessarily all give the same town as the place to which they went for the weekly shopping expedition, and this would indicate that the particular place concerned was within the influence of two or more larger places. The results of such a survey can be mapped in two ways:—

- (i) By drawing lines joining all the places served by a particular shopping centre and distinguishing between places visited for weekly and occasional expeditions (the service area of a centre used for daily shopping will seldom be large enough to be significant at the regional scale), which will give a number of overlapping areas of approximately circular shape, and
- (ii) by drawing rays from each place to the place or places used by it for shopping purposes.

If, in answer to the questions asked, any clearly atypical answers are given, e.g., the use for weekly shopping purposes of a town much further away than those given by the other people questioned, they should be ignored in plotting the results of the surveys, but where such answers are obtained precautions should be taken to check that they are truly exceptional and due to individual whim rather than to any special advantages, not immediately apparent, of the places so named.

The use of shops to determine areas of influence is not a perfect method. Local deficiencies in public transport and variations in the attractiveness of towns as shopping centres, both non-permanent factors capable of being changed comparatively quickly and easily, may cause distortions of the pattern which would otherwise be formed. But it has the great advantages that shopping is an almost universal activity not restricted to particular categories of people and that the choice of shopping centre is not influenced by restrictions artificially induced by extraneous factors such as administrative boundaries. Where there is any reason to doubt the reliability of the results given by the survey a check could be made by carrying out some completely different survey, such as the areas served by local newspapers (approximately equivalent to the weekly shopping area.)

Another map which is required, either separately or, preferably, in combination with the areas of influence map, is one showing *the existing population* of every community and the principal services supplied by each. The necessary information can be shown in many different ways; there are a few points of importance regarding the content which require special attention:

The populations of towns can be obtained from the Census but this is compiled in terms of local government units; developed areas which are physically, economically and socially part of a particular town but which happen not to be within the borough or urban district boundary, are not included. Since such areas may form quite an important part of the town's population, it is necessary to decide the boundaries of the development

which ought to be included within the town and then to calculate the population living within them but outside the urban authority's area.

There are several ways in which this can be done, short of a house-to-house count of population. The first and most common method is to count the number of houses involved and to multiply the total by the local or even national average number of persons in a house. This may often serve well enough, but in areas which are exceptional in any way may give rise to considerable error.

Another method is to count from the electoral rolls the number of voters within the areas concerned, and, in order to arrive at total population, to multiply this by the Census figure of the total population of the rural district, and divide the result by the total number of voters in the rural district. This generally gives a better result than the previous method, since it is unaffected by local variation in house size, but it ignores the possibility of the local distribution of age groups being abnormal because it assumes a constant proportion of people under 21 years of age to people over 21.

A third method is to conduct a sample census by making personal inquiry as to the number of people living in each house visited, and arrive at an average from the answers obtained. The number of houses visited need not be very large in proportion to the total, but it is necessary that it should be a truly random sample and that any houses on the list which are clearly inhabited, but where at first visit no one is at home, should be re-visited until success is achieved, since these may be the houses occupied by the smallest number of people, and to ignore them would result in too large an average figure being obtained.

The same methods are applicable to villages. Some such calculation is essential for these since no population figures are published for villages but only for parishes; a given parish may include two or three villages or hamlets and also areas of semi-urban development, so that parish population totals are frequently useless. It is often a matter of considerable difficulty to determine the appropriate limits of a village, since many villages are extremely loose in texture, and merge almost imperceptibly into the scattered development of the open countryside.

The services supplied by a place fall into two main categories: those which arise from the existence of buildings—shops, churches, village halls and pubs., for example, and those provided by organisations such as women's institutes, amateur dramatic societies, etc. It is important that they should not be confused; whatever notation is used the two should be sharply distinguished. Buildings are the permanent equipment of a place, which can only be diminished by demolition and added to by construction; their number, size and equipment are a measure of the adequacy of the place to support social institutions in comparison with its population, while the institutions themselves, several of which may use a single building, are apt to be not nearly so permanent as the buildings. They may rise and wane, come into existence and disappear quite independently of the buildings they use. The number and size of the institutions are nevertheless a measure of the social virility of a place and of the likelihood that additions to the building equipment are likely to lead to satisfactory use. Together, the buildings and

institutions indicate the strength and adequacy of the place as a service centre. Comparison of these different places and of their comparative populations can give substantial assistance in deciding which places should be encouraged to extend, both as regards population and buildings providing services, to bring about the optimum spatial distribution of such services.

While all the principal services provided in villages should be shown, it is quite unnecessary at the regional scale to show the smaller urban ones which cater entirely for a town's own population. Attention should be confined to those, such as libraries, cinemas, secondary schools, hospitals, etc., which are used by people living outside the town.

(2) Employment

A map should be prepared showing the total number of workers employed in each community, subdivided into different kinds of employment.

Where any substantial number of people work in a town or village other than that in which they live the origins and destinations of journeys to work should be shown diagrammatically. In Britain this information can be obtained from the Usual Residence and Place of Work volume of the 1951 Census; elsewhere, or where it was desired to obtain more detailed or up to date information than that provided by the census, the normal methods of sampling could be used.

Surveys under this heading are capable of indefinite elaboration; one could, for example, go on to examine the types of employment in which people working outside their home towns were employed, or, conversely, the locations of the homes of workers in each particular kind of employment in each town.

It will be well to consider carefully what guides to Planning action are likely to be found from such further investigations before beginning them, having regard to the limited powers of control available.

Where important changes in employment structure appear feasible in pursuance of Planning policy or inevitable in the light of economic exigencies, such additional surveys may, however, be of great importance in helping to redistribute employment with as little upset as possible. An investigation of the extent to which particular industries in an area are tied to a particular location or can, on the other hand, move with comparative ease is likely to be of special value where it is sought deliberately to bring about wide changes.

(3) Population Changes

It is useful to know what changes of population have taken place within the region over the last twenty years or so. This can best be done on a local government area basis, breaking the rural districts down into parishes. Distinction should be made as follows:

Static areas (less than 10 per cent. increase or decrease).

| | | |
|----------------------------|-----|------------------------------|
| Areas of moderate increase | ... | 10 per cent. to 25 per cent. |
| Areas of great increase | ... | more than 25 per cent. |
| Areas of moderate decrease | ... | 10 per cent. to 25 per cent. |
| Areas of great decrease | ... | more than 25 per cent. |

Often the map will show nothing that could not readily have been anticipated—increases in and around town and decreases in the poorer and more remote country areas; but anything not fitting in with this pattern may provide a pointer to unusual conditions capable of being remedied or taken advantage of by Planning action.

In order to avoid undue significance being attached to numerically very small changes which have taken place in thinly populated parishes, which appear on the map as great increases or decreases, the actual numbers of people involved in each unit should be shown on the map.

5-5. GENERAL

(i) *Land Use Map*

This indispensable map will be a generalisation of the land use maps of towns and villages if these have already been made; otherwise special surveys will have to be carried out to a degree of detail no greater than that required for the appreciation of land use distribution at the regional Planning stage.

Many of the surveys already described have indicated the distribution of land uses as between different places; the land use map itself shows the geographical position and extent of each major use.

Such a map has to be used with care, since it must be realised that the importance of a use is not necessarily to be measured by the area of land it occupies—e.g., an industry using a very large site at an unusually low intensity. Conversely, some extremely important uses which take up little space may be impossible to show at the regional scale, so that the limitations of the map must be realised, and its use combined with that of the other regional surveys.

It is important not to overcrowd the map with information; the local use surveys will provide detailed information wherever considerable general development is likely to occur.

Building uses can probably best be divided simply into the following categories :

Residential;

Business;

Industry;

Public Buildings (Schools, Hospitals, Town Halls, etc.); only substantial areas of each being shown.

Some public buildings occupy sites so large that they are virtually a special kind of private open space and should be so indicated.

Open spaces should be divided into:

Public open spaces—parks and playing-fields, to which the public in general has access at all or most times without payment, irrespective of ownership.

Private open spaces—golf courses, large grounds of institutions, etc., privately owned playing-fields, large areas of allotments.

Sewage disposal works of large extent, large areas used for military, naval and R.A.F. purposes, and land being used for the surface working

of minerals, all of which may be located in the open country, should be separately indicated, and also areas to which the public have access under the National Parks and Access to the Countryside Act, 1949.

All the above items should be represented boldly, and, as a background to them, the information given by the 1 in. to the mile maps of the land utilisation survey of Great Britain, showing pasture, arable, rough grazing, woodland, orchards, market gardens, and agriculturally useless land could be lightly coloured in. The land utilisation survey maps for most areas require fairly thorough revision to bring them up to date, and the necessary information can sometimes be obtained from the Ministry of Agriculture, or, failing this, from aerial photographs, supplemented by personal investigation. This information is not, of course, essential. Its mapping involves a great deal of work, but the vivid picture which it gives of the general character of the countryside and, to the discerning eye, of relative agricultural values in different areas, makes it desirable that it should be included if the necessary labour can be spared.

The Land Use map provides an indispensable general picture of the planning area, and, except for the next map to be described, provides more information than any other regional survey map.

(ii) *Sieve Map for selection of large areas for development*

The following items should be shown:

All on the physically difficult land map (i.e., areas subject to excessive height and slope, unfavourable aspect, flooding and waterlogging, excavated areas and spoil heaps, areas liable to subsidence, areas used for sewage or refuse disposal).

Land of the highest landscape value.

The most valuable agricultural land.

Areas in which minerals to be won by surface working lie.

Water-gathering grounds.

Areas which cannot readily be supplied with water.

Areas which cannot readily be sewered.

Land comparatively remote from existing communities.

Some explanation of the use of this map is necessary. It is only useful for the selection of areas for really large-scale development, a neighbourhood unit being probably the smallest area in connection with which it can be appropriately used.

Isolated houses and small extensions of existing communities cannot be sited by reference to it because many adverse factors may apply to the whole of such a community and the surrounding land, so that if any further development is necessary, the adverse factor must be accepted; many villages, for example, lie wholly within areas of the highest agricultural value or areas liable to flooding.

Some factors, such as uneconomic levels for sewerage and large areas of very steeply sloping land, may constitute an absolute or almost absolute bar to large-scale development, while others, such as high landscape or agricultural value, are only disadvantageous in comparison with other areas.

If the factors have been correctly selected and appraised, areas which are subject to no absolute and few or no relative disqualifying factors are those which should first be considered as sites for development, and only if these prove unsuitable on general planning grounds should search be made among areas more strongly disqualified.

It is necessary to stress the proviso that suitability on general Planning grounds is a prerequisite for selecting an area for development. Land subject to slight disqualifying factors should, of course, always be selected in preference to land subject to none if it is suitably located in relation to existing development and the latter is not. As regards new towns, the layout of the transport network and the location of other towns may make it necessary to select a site other than that indicated as the most suitable by the sieve map.

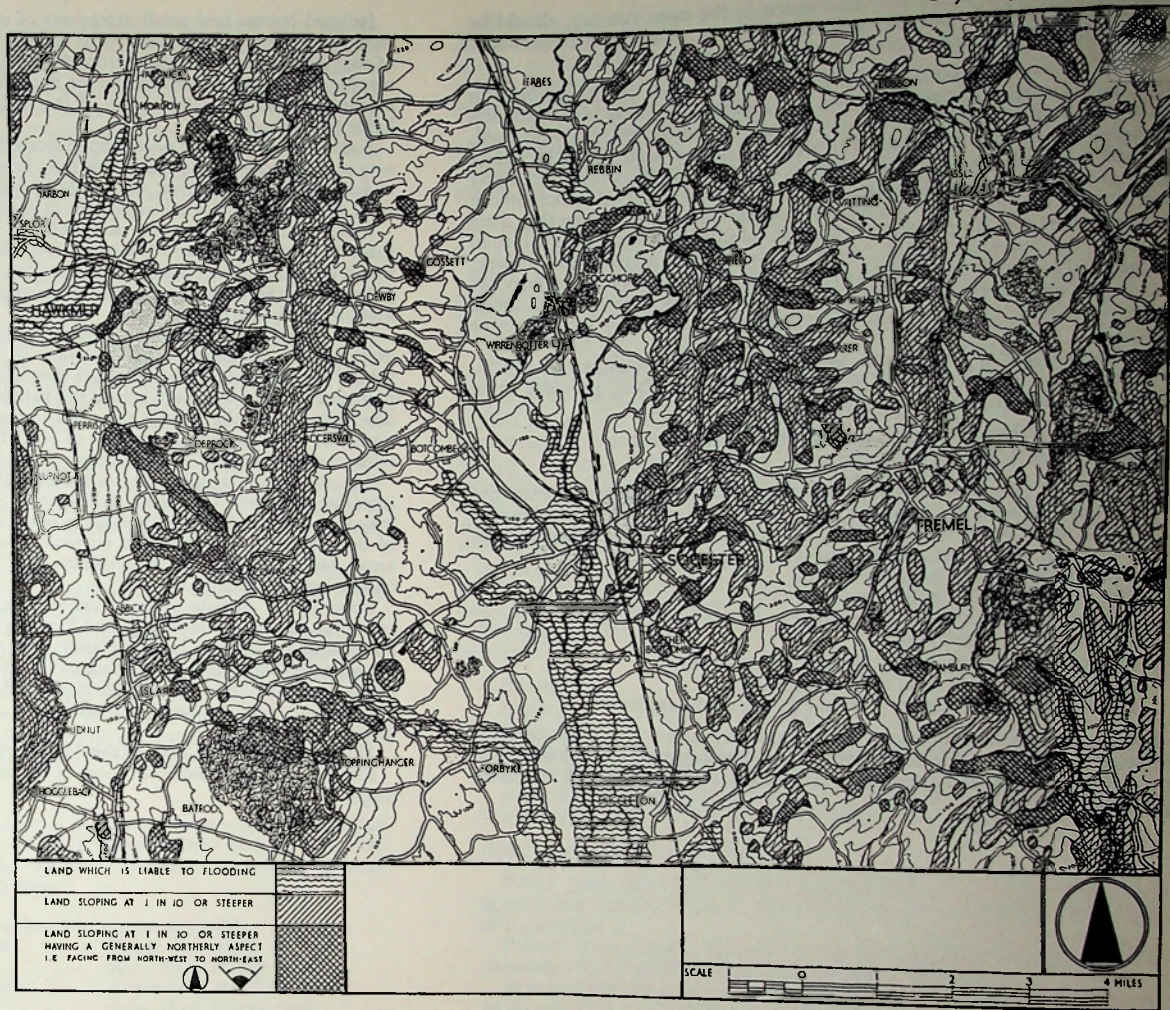
The map must in many respects be regarded as merely a guide to the tentative selection of areas for development; on the evidence it gives there may well be several sites of apparently equal suitability for a particular piece of development; this evidence narrows down the area of search to these areas, and more detailed investigation then becomes necessary in order to choose between them.

Nevertheless, in spite of these reservations, a sieve map of this kind is of enormous value in summarising and focusing the land suitability problems of a region and is, indeed, in my opinion, the only means available of reducing the numerous and complicated factors involved to comprehensibility, which makes it all the more remarkable that the Ministry of Housing and Local Government neither require its submission nor specifically recommend its preparation.

The preparation of a map of this kind is explained in Chapter 3, page 30.

Figs 6 to 12 are examples of some of the most important Regional Survey maps.

FIG. 6. PHYSICALLY DIFFICULT LAND. This is the first of a series of illustrations showing important regional surveys. The area included does not comprise a complete region because of difficulties of scale. This illustration shows land which, for purely physical reasons, it is difficult, costly or undesirable to use extensively for building purposes.



Landscape Survey

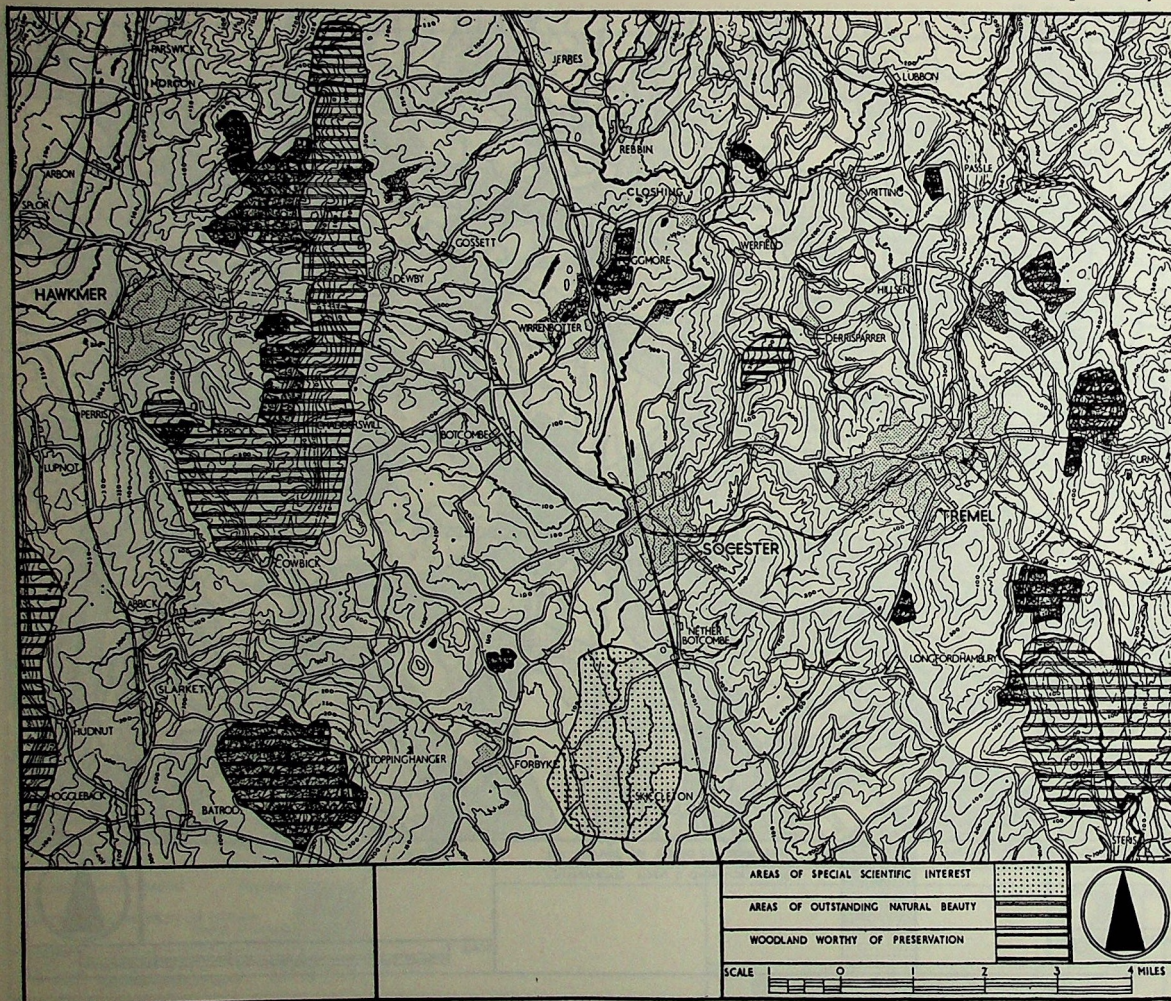
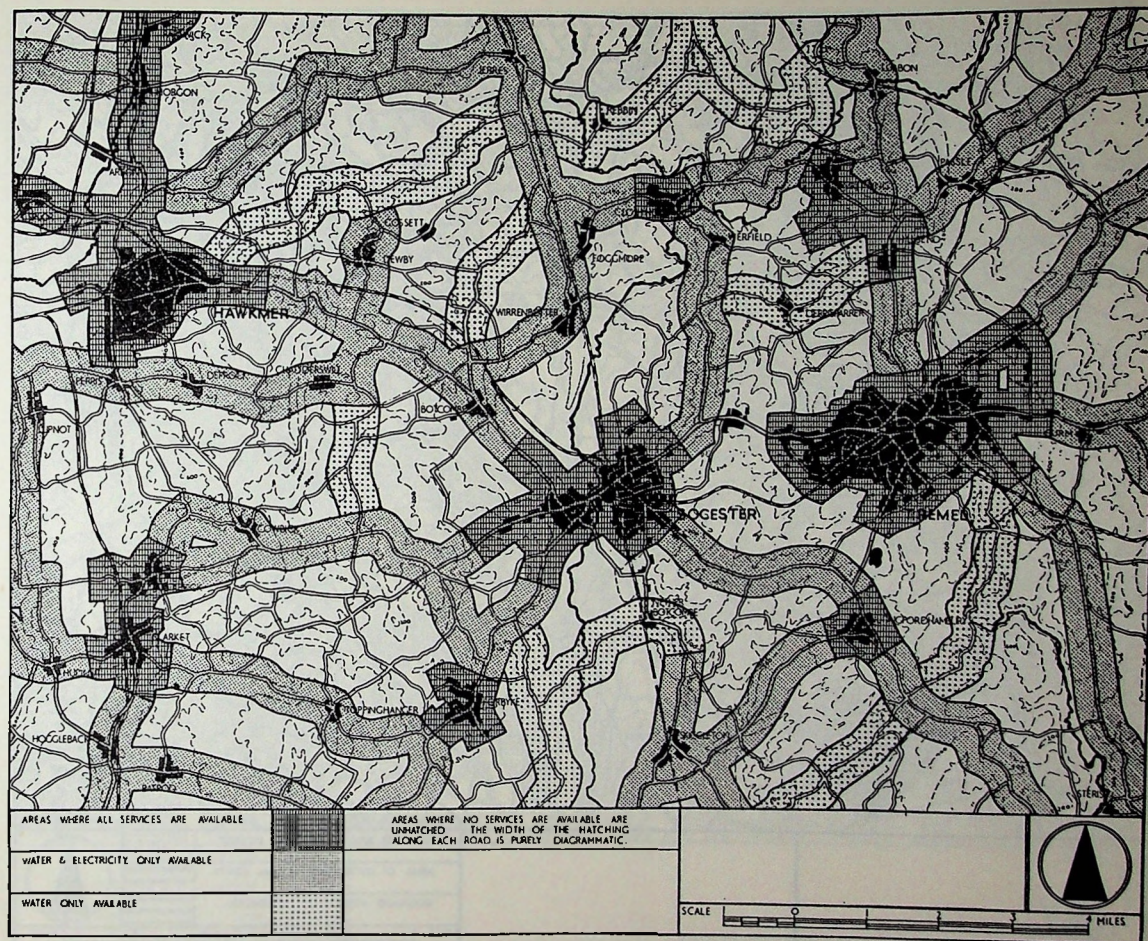


Fig. 7. Areas which, for visual or biological reasons, deserve to be protected.

Fig. 8. Diagrammatic representation of the distribution of existing public services.



Traffic Density

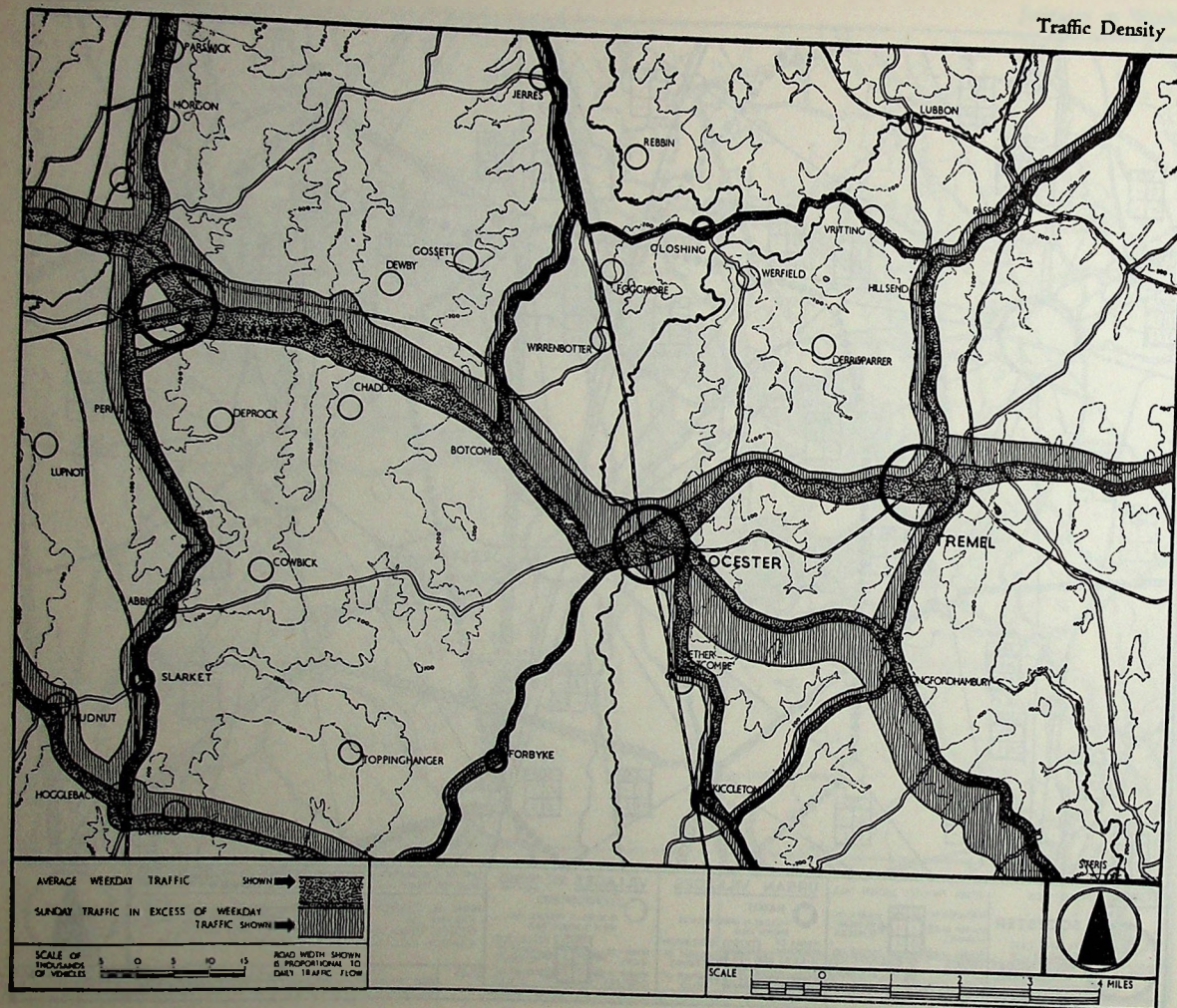
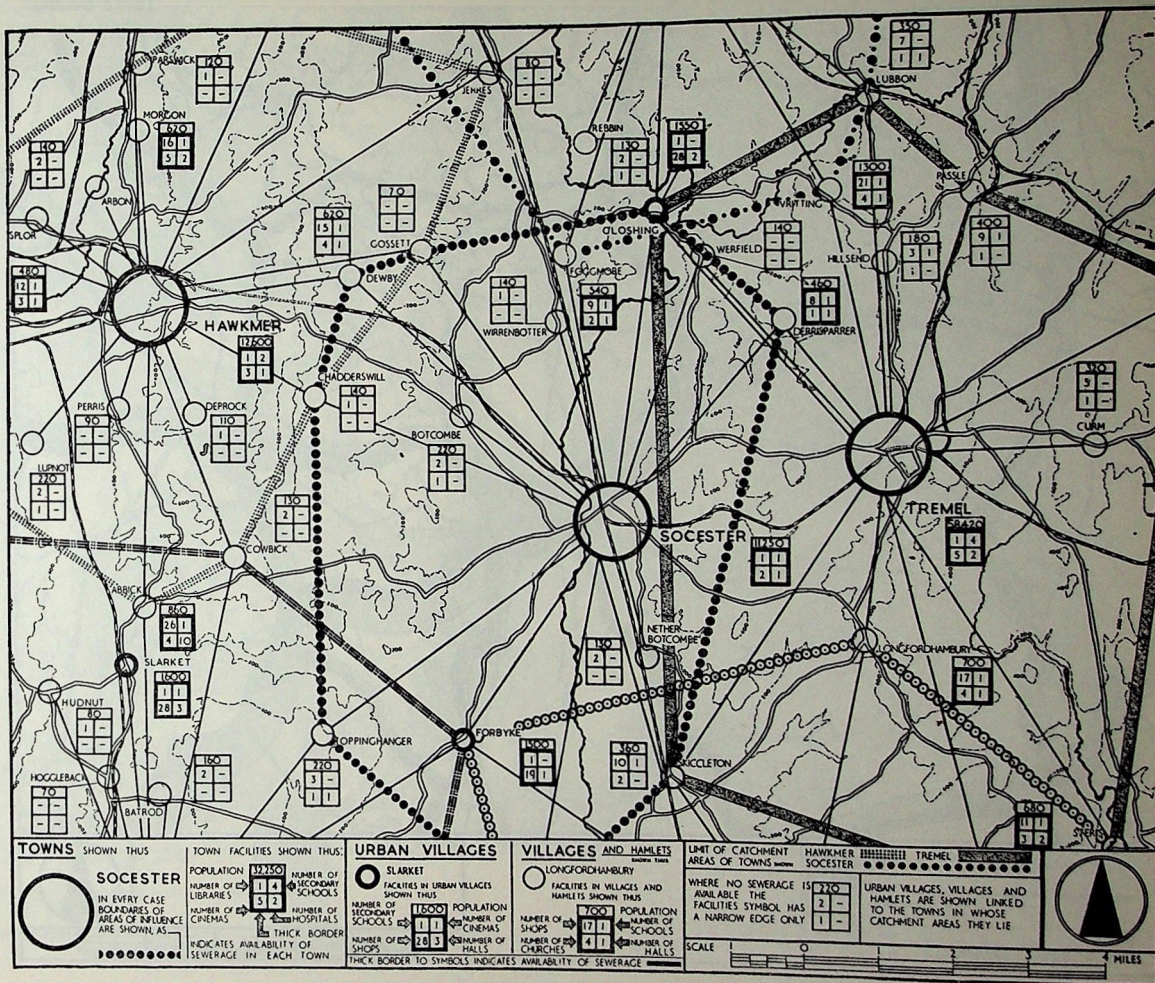


Fig. 9. THE MAIN PATTERN OF TRAFFIC DENSITY. Note that this shows density of traffic, not its origin and destination.

FIG. 10. AREAS OF INFLUENCE. This map shows existing populations of towns and villages, the most important and distinctive central services available in each and the areas of influence of towns in relation to the "weekly shopping visit" level of services. For higher services the area of influence of Tremel would no doubt spread much wider.



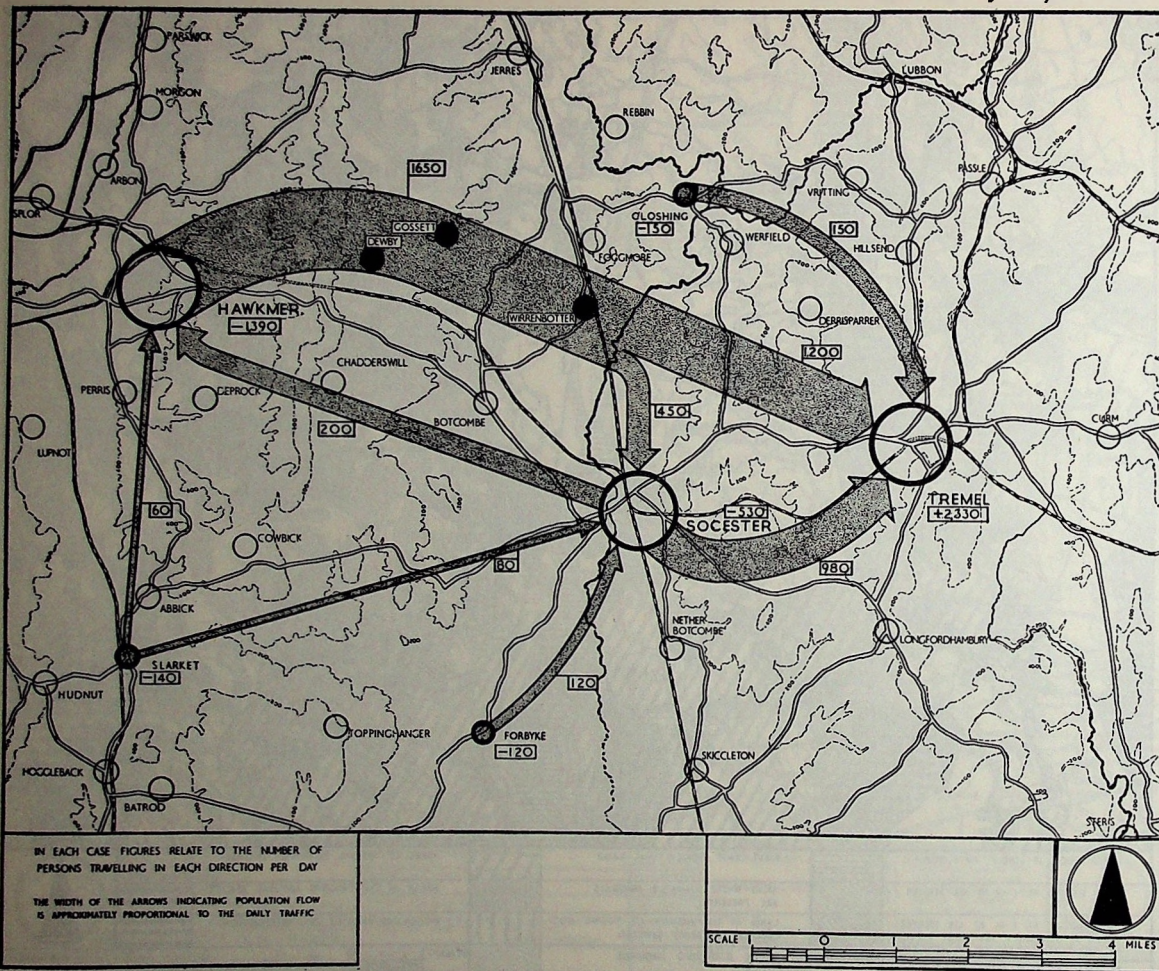
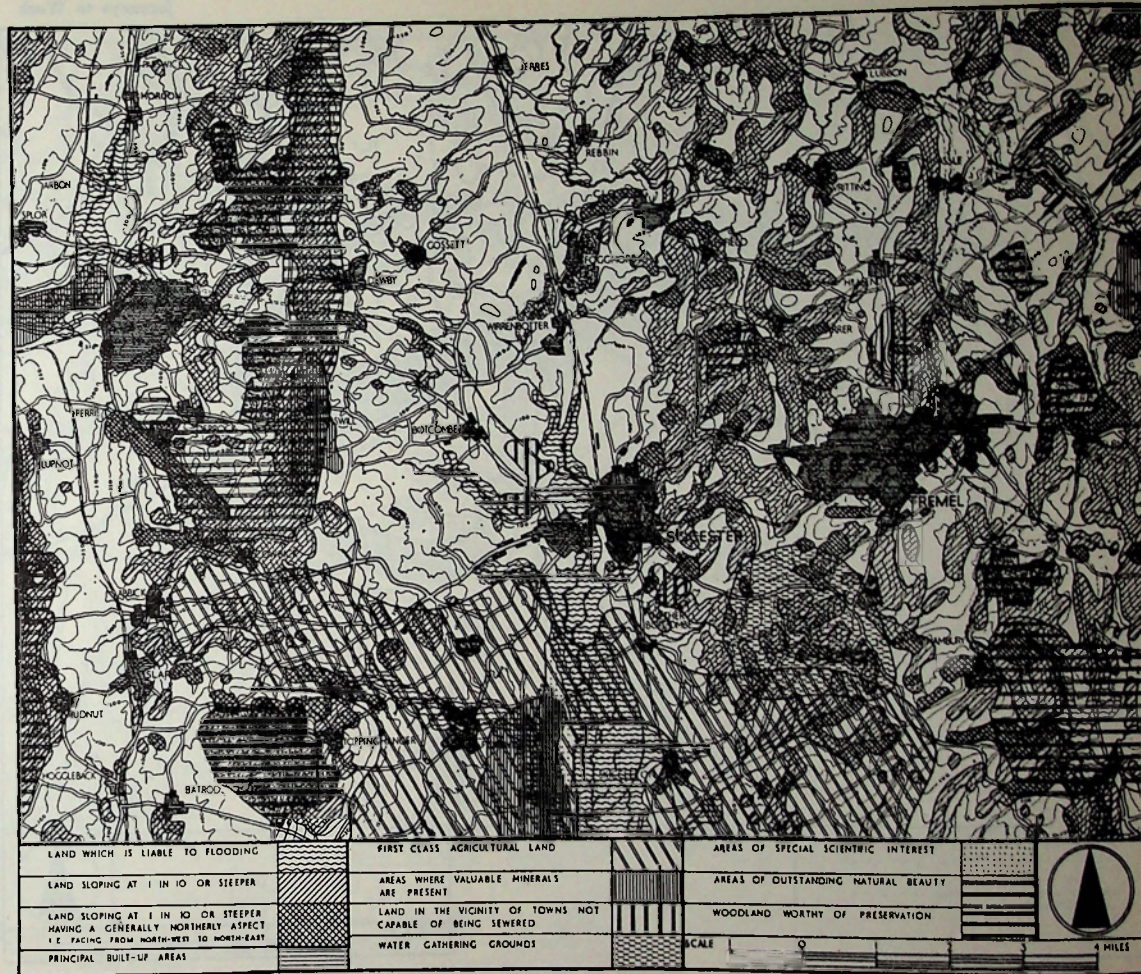


FIG. 12. FACTORS LIMITING DEVELOPMENT. The information shown on Figs. 6 and 7, together with information relating to agricultural value, mineral bearing land and water-gathering grounds and areas not capable of being economically sewered is combined here to form a sieve map. It is to be emphasised that this map is mainly useful in selecting areas for extensive development.



First Stage Diagram of Regional Plan

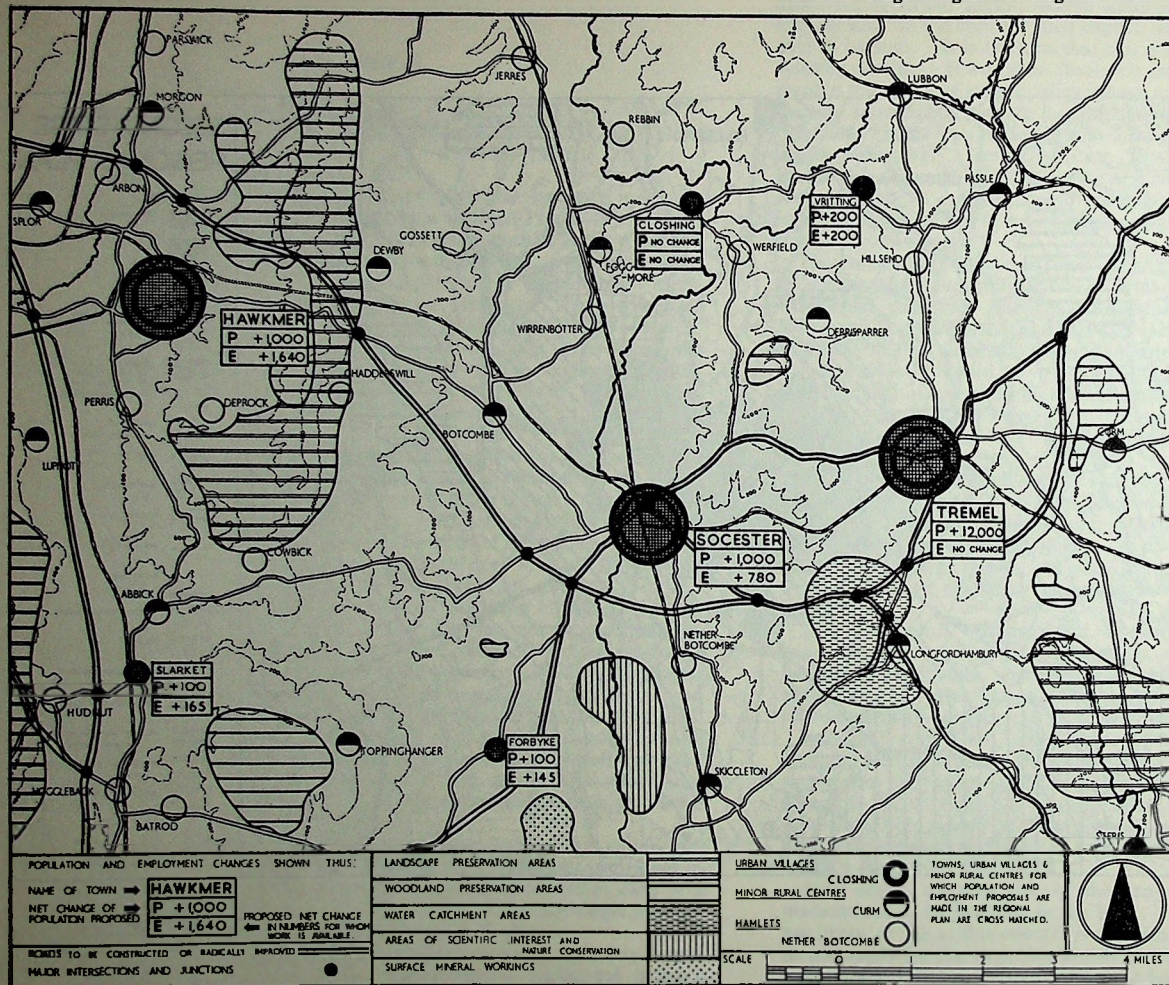
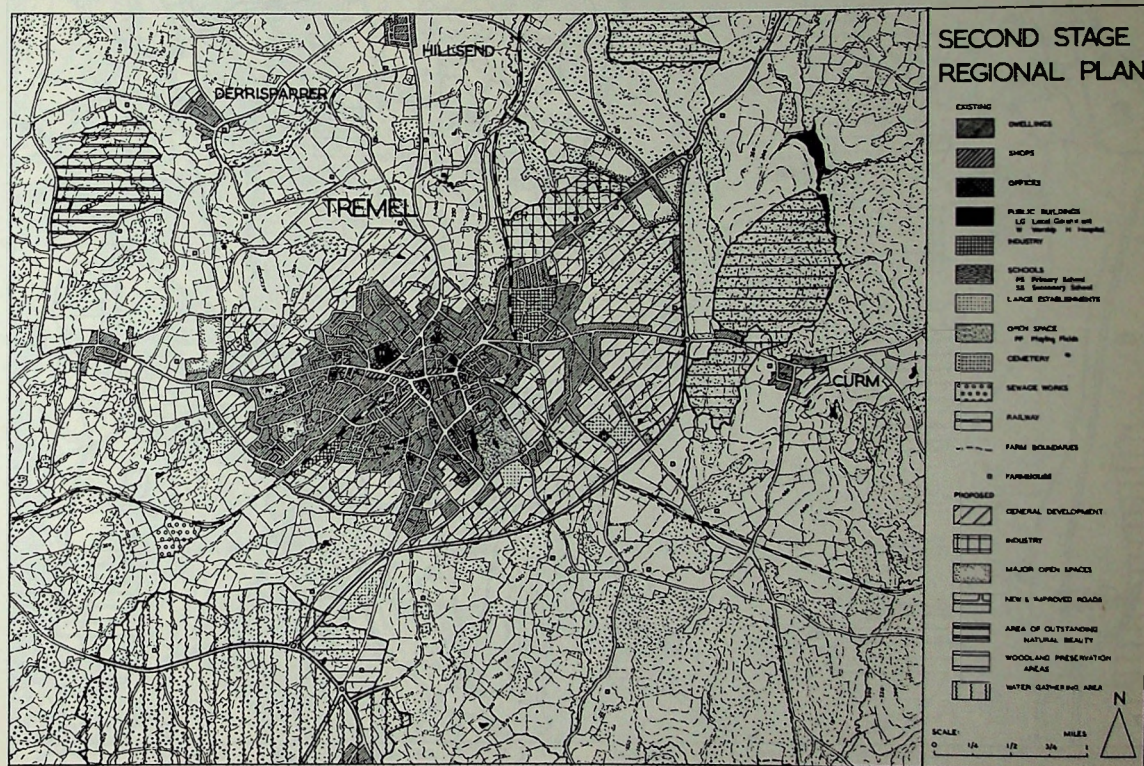


FIG. 13. OUTLINE REGIONAL PLAN (or First Stage Diagram). It is assumed that the population of this part of the region is intended to increase by about 14,500, as the result of metropolitan decentralisation added to natural increase. The most important proposals are for the redistribution of population and industry. In particular, Tremel, which at present imports large numbers of workers, can be substantially enlarged without need to increase facilities for employment. Both Socester and Hawkmer are also slightly enlarged, but with a more than proportional increase of employment facilities, so that they shall no longer need to export workers.

Fig. 14. SECOND STAGE REGIONAL PLAN. Part of the area shown in Fig. 13, illustrating the transition from "diagram" to "map" representation of proposals. This map should be compared with Figs. 24-32 in order to see how the degree of detail of Planning proposals increases step by step.



CHAPTER 6

PREPARATION OF THE REGIONAL PLAN

6-1. CONTENT

IT IS BY no means easy to describe definitely or succinctly the actual processes which need to be gone through in preparing a regional Plan. It is seldom indeed that a regional Plan can be prepared in a straightforward and orderly fashion, uninfluenced by either previous partial attempts or the immediate, pressing problems of detailed Planning, the solution of which cannot await the working out of the full Planning process. However, for purposes of discussion and exemplification, at least, such orderliness can be assumed.

Obviously any national Plan which may exist will have to be taken into account when preparing a regional Plan. It may well be necessary, if it has not already been done, to discuss and debate with the authority preparing the national Plan the exact meaning and implication of their proposals. No more need be said on this subject.

Assuming that adequate surveys have been prepared for the region, the next step is to interpret them, both individually and in relation to each other, in order to obtain the clearest possible picture of the region's requirements, potentialities and shortcomings from the Planning point of view. The culminating stage in this should be to draw up a list of the principal Planning problems of the region; this may well suggest the need for the amplification of certain surveys to assist in discovering the appropriate solutions.

Usually the main problem will relate to the balancing of population and industry, and it is likely that other aspects of the Plan will depend upon the solution adopted, for both the arrangement of rural services and improvements to the road system will necessarily be influenced by the general disposition and relative sizes proposed for the main centres of population and employment in the region, though it may well be that the latter two items will in their turn suggest modifications of the first. For example, the opportunity to secure a better balanced distribution of urban services may well prove the deciding factor in selecting one town rather than another for substantial expansion and the same may apply where one or more towns already enjoy particularly advantageous communications.

The proposals for the redistribution of population and industry call for the most careful and earnest investigation, and it will be necessary to work out in as great detail as practicable the implications which follow from each of a number of alternative solutions, for it is most unlikely that any single solution will show itself as having clear-cut advantages over all others.

The general principle to be followed is clear enough; that any towns importing large quantities of labour should receive additional housing sufficient to increase the labour force to the figure required by the town's employment resources and, conversely, that any town exporting large

quantities of labour should receive additional industry sufficient to provide employment on the spot for such export, an attempt being made to reach an overall balance. It is obvious that this is an over-simplification of what is actually possible. It would be absolutely impracticable to carry out development in pursuance of such a policy in such a way that large numbers of houses became untenanted because homes had been provided for their original occupants much closer to their places of work, nor indeed is it ever possible to secure more than a rough balance. Under the most perfect conditions imaginable, it would be necessary for appreciable numbers of people to travel long distances to work, either for purely personal reasons, or because of the location of specialised forms of employment which could not be spread over the whole of a region.

The balancing process is of course facilitated where, as a result of a policy of metropolitan decentralisation, it is intended that a region shall receive substantial quantities both of additional population and of additional industry. Within limits, it is then possible to distribute these in such a way as to secure balance without wastage of existing homes or workplaces.

Nevertheless it would be wrong as a long-term policy to rule out entirely the possibility of a net reduction of homes and workplaces in particular towns, where the buildings concerned in either or both categories were in bad physical condition and there were no strong economic or social reasons for replacing them.

It is absolutely essential to make sure that any town selected for increases of homes or workplaces should be physically able to receive them; that, in particular, there is sufficient land physically suitable and appropriately located for the purposes required. It may often be necessary where any doubt exists about this to carry out at once some at least of the surveys normally carried out when preparing the town Plans in order to resolve the matter.

The substantial expansion of a town may have important social consequences; it is essential to consider, when making decisions about re-location of population, whether the towns tentatively selected for expansion are of a character likely to provide a congenial environment for the population to be imported, whether the existing population is likely to take kindly to "invasion" and, if not, whether the economic need involved is important enough to justify ignoring the resentment and possible exodus in considerable numbers of existing population. This, of course, is a political rather than a technical matter the final decision upon which must be made by elected representatives, guided by their professional advisers, but not so completely dependent upon that advice as they ought perhaps to be in other matters.

Next comes consideration of the proposals for improvements of communications to be included in the Plan. These, as explained in Chapter 4, are likely, so far as this country is concerned, to be confined almost entirely to proposals for the improvement of roads. Probably the most important consideration here is to decide upon the best way of allocating the resources available for work of this kind, which, even in the best circumstances imaginable, are likely to be far less than those required. It is not a difficult

matter to draw up an ideal Plan for the improvement of the main road system of a region; all that is necessary is to decide upon the principal traffic routes existing and future in the light of traffic surveys and proposals for the redistribution of population and industry, to show lengths of new road where necessary, and lengths of road to be improved where they already exist but are not constructed to a sufficiently good standard for modern requirements. Proposals in this form are, however, practically useless. It is necessary to prune them by limiting them to what is essential, to look at this from the point of view of doing such work as will lead to an overall improvement in the quality of the road system rather than the construction of a few lengths of magnificent road to the neglect of the remainder, and to work out an order of priority for the works of improvement selected so that not only will the results at the end of the Plan period be as good as possible but that improvement is progressively achieved throughout the period.

This involves a great deal of careful and complex consideration, for it is necessary to decide the priority to be given to a very large number of almost equally urgent requirements and to visualise each possible item of work not only in terms of the local improvement of conditions to be secured by it, but in relation to the road system as a whole. For example, it may well be less advantageous to construct 12 miles of new dual carriageway road where the existing road is seriously inadequate, if at each end there are still left skew bridges and lengths of narrow and winding carriageway, than to carry out comparatively minor improvements along the whole of a particular route where it traverses the region if by so doing road conditions throughout its length can be made tolerable, if not ideal. This is not to say that it is not desirable to include in a regional Plan all very important road proposals, however remote of attainment they may seem, for it is also necessary to relate comparatively short-term proposals to the ultimate pattern envisaged so that the former may make the greatest possible contribution to the latter, and not conflict with it.

It is almost impossible to generalise about the proposals which may be required regarding the redistribution of services in rural areas, for the complexities involved defy classification. But one may perhaps safely say that as even a distribution as possible should be sought over the region as a whole, though locally the concentration of facilities in fair measure at a limited number of points is better than to seek a diffusion over the largest possible number of settlements. It is quite impossible for every village and hamlet in the country to be provided with even a reasonable measure of public services and facilities (though there seems to be no settlement whose inhabitants are willing to acknowledge that it is one to which this principle should be applied). It may also be said with some confidence that within limits a settlement selected for the introduction or improvement of any particular facility should also receive others, rather than its neighbours, for the different facilities tend to supplement and strengthen each other, providing a total level of convenience much higher than the sum of each. Even so, it may be necessary, where a particular village is in very dire need of some particular item, to provide it, even though this may not fit in with the best general arrangement.

Schools and shops constitute the urgent, irreducible needs of all rural settlements, but though it may be possible for every settlement to have some shopping facilities, however slight, the provision of a school is limited by the existence of sufficient population within an accessible distance to provide sufficient pupils for it to be a reasonably economical proposition for the education authority. This means that under present conditions there must be fewer primary schools than there are villages, and correspondingly fewer secondary schools than villages. This is made clear by the fact that since the children of school age at present form about 1/60 of the population for each year of age, a total population of some 1,200 is needed to support a school with a separate class for each year of age and no class with fewer than 20 children in it.

As suggested in Chapter 4, we may well be moving to a stage where the concentration of population in fewer larger villages, leaving others to become gradually depopulated, may be economically and socially desirable; but the provisions inserted in a regional Plan must take account not only of possible eventual redistribution but of present requirements. It can hardly be too strongly stressed that many, if not most, rural facilities need to be located in relation to the amount of population immediately adjoining them rather than to the total possible catchment area, for the former provides a far more reliable clientele, less affected by such factors as bad weather, than those more remote.

The distribution of rural population is not exclusively, though it is primarily, concerned with the location of agricultural workers and those supplying them with services. Many retired people both well-to-do and otherwise, want to live in rural surroundings, and, in the case of villages fairly near towns, a large number of urban workers also prefer to live in a village—in which case it performs a suburban function as well as being a rural centre. Such immigrants are very much to be welcomed, provided they do not unbalance the rural community pattern by settling in excessive numbers in a particular place. Usually they have a preference for a locality rather than for one particular village, and there is no reason why the total amount of non-agricultural development permitted in each village should not be limited so as to prevent unbalancing, nor, in my view, is there any reason why it should be permitted in hamlets which are inevitably doomed to disappear, although the advent of a very few immigrants in a hamlet which has good reason to survive, even though its agricultural population cannot appreciably expand, may be extremely beneficial.

The regional Plan can only take account of those demands for the use of open country for non-agricultural purposes which are fairly definite. These can seldom be accommodated without some damage to the rural structure, and the best that can be done is to make a very careful selection, in the light of all the survey information available and of the known land requirements of particular users of the land best suited to receive them. It is also of great importance to extend this enquiry so as to be in a position later on to make positive suggestion for demands which may then arise, rather than to be

faced with a demand for a particular site without being able readily to suggest alternatives.

It is necessary to understand clearly the ways in which regional Planning proposals can be implemented and the severe restrictions upon this which exist. If a town is merely shown on a Plan as intended to receive an increase of population or industry, or a village shown as intended to be up-graded to a major rural centre, this will have absolutely no effect upon these places in the absence of steps to promote the development required, or in other cases to prevent that not desired. There are broadly three ways in which the desired results can be brought about, none of them infallible. The first is to zone sufficient land for, for example, residential and industrial purposes to accommodate the development required in particular places, and both to refrain from zoning land and firmly to resist development elsewhere. The second is for public authorities themselves to carry out particular forms of development in the areas selected for it in the Plan. The third is, by means of financial inducement, to encourage private developers to carry out development in one place rather than another.

As regards the first method, it is obvious that if large amounts of land are zoned for residential and industrial purposes in all towns there is absolutely no guarantee that development will in fact occur in the places and in the quantities demanded by the proposals of the Plan. It is also clear that even where proper zoning is carried out, development will still not take place unless the site zoned provides conditions satisfactory to prospective developers, though the more restrictive the zoning the greater will be the chances of attracting development, for houses and factories will be built on comparatively unattractive sites if they are the only ones obtainable.

As regards the second method, its limitations depend upon the current policies of the authorities concerned, though no authority will willingly carry out the development which involves too wasteful an employment of resources. For example, education authorities are often compelled, in thinly populated rural areas, to provide schools far smaller than can be economically staffed and administered because only by doing this can they provide a reasonable degree of accessibility to a school for the population concerned. But private developers are not concerned with these considerations, and as regards those types of development normally provided by private enterprise, of which shops are a convenient example, even the most rigid selective zoning will be of no avail unless there are also proposals to see that in, for example, the villages where it is intended to permit shops to be erected, there is also enough land zoned for housing to accommodate sufficient people, together with those already in the village, to make the provision of shops an attractive proposition. Broadly, therefore, the provision of facilities of all kinds must be linked to residential zoning proposals, though publicly provided facilities are less severely limited by this than private ones.

The third method has not been extensively applied in this country, the most familiar example of it is the financial advantages offered under the Distribution of Industry Act by the Board of Trade to developers willing to

build factories in the Special Areas. It could theoretically be applied to such things as the provision of shops in rural areas by offering subsidies or rate rebates to new shops in selected villages, and would then do something to narrow the gap between the limitations on publicly and privately provided facilities in the previous paragraph.

The decisions on all these matters should first be embodied in an outline regional Plan.

6-2. PRESENTATION

There seems to be wide support for the idea that regional Plans can best be presented in two stages, first a diagram showing no more than the positions of the main proposals, and, second, a map, drawn to a larger scale and showing, as far as possible, the extent of the areas proposed to be used for various purposes.

The First Stage Diagram. Several excellent examples of such diagrams have been published. The diagrams in the Preliminary Outline County Plan for Kent, in the Tay Valley Plan, in the Preliminary Outline Plan for Hertfordshire and in the Preliminary Plan for Lancashire are particularly good.

The Kent diagram shows by means of symbols the predominant characteristics and present and intended future populations of each town, while villages intended to be major and minor rural centres are differentiated. It also indicates areas for landscape preservation and conservation and the future pattern of the principal roads. The Hertfordshire Diagram is similar, while the Lancashire one, confined to proposals for the decentralisation of population, is a splendid example of the way in which a diagram can clearly portray complicated subjects.

A typical list of items to be shown on a first stage, regional diagram might comprise the following :

Present and intended future population and predominating characteristic of each town, together with an approximate indication, expressed in numbers of employees, of the extent to which employment facilities should be increased or reduced to secure industrial balance.

Major rural centres: the intended population of each and the principal services, existing and proposed.

Minor rural centres.

The proposed main communication network.

The location of large, or otherwise specially important, areas for :—

Landscape preservation.

Nature conservation.

National and regional parks.

Public access to countryside.

Woodland preservation and afforestation.

Smallholdings.

Reservoirs and water catchment areas.

Manufacturing industry outside towns.

The surface working of minerals.

Military use.

The scale of such a diagram could generally be a quarter of an inch to one mile, and the minimum of detail should be shown on the base map. (See Chapter 3.)

Many proposals for the use of large tracts of land for reservoirs, military training, etc., are of course, likely to be made after the preparation of the regional Plan and cannot be foreseen; the problems connected with *ad hoc* proposals of this kind are dealt with in Chapter 19.

Fig. 13 is an example of a first stage diagram for part of a Region.

The Second Stage Map. The Greater London Plan Master Plan is, both in content and form, such a map, but since the area concerned is so predominantly urban, it is hardly typical. "County Palatine, a Plan for Cheshire," contains a map to a scale of one inch to one mile, which shows the proposed extent of urban land uses and of various kinds of rural reservation in some detail, but as regards rural communities it is more in the nature of a first stage diagram, since it indicates their proposed status in the hierarchy of settlements but does not prescribe areas of development for them.

Many maps which fulfil the suggested requirements of a second stage map were prepared by Joint Planning committees before the Town and Country Planning Act, 1947, came into operation.

The second stage map is of great importance, even though its preparation is not statutorily required, for it gives a comprehensive picture of the spatial relationships of land uses, including size as well as relative positions. It also provides a framework which enables the merits of applications for permission to develop land to be judged on something better than a mere *ad hoc* basis until more detailed local Plans have been prepared.

An appropriate scale for the second stage map is 1/25,000. This is the smallest scale at which enclosure boundaries can be clearly shown, and hence at which the boundaries of areas devoted to various uses can be shown with any degree of accuracy. Although its size is likely to be such that it will have to be prepared in sections, the first stage map, at about one-tenth its scale, serves as a key to it which should enable the contents of each section to be related to the whole quite easily. The size of each section should be determined by the sizes of the walls and tables available.

The second stage map need not include the statistical information such as proposed populations, etc., shown in the first stage diagram but can be confined to depicting areas of use and communication routes.

A typical list of items for inclusion in the second stage map is as follows :—

The main areas to be used for business, industry, dwellings, major public uses and major open spaces in each town, areas of existing and of proposed use being distinguished.

Similar information, so far as may be necessary, in respect of each village. Normally there will be little or no segregation of uses, and all that need be done is to indicate a single area within which it is intended that development should be confined.

All the areas for specific uses shown on the first stage diagram, but in greater detail.

The future communication network in similarly greater detail, distinguishing portions which exist and are not intended to be altered, those to be improved and to be created and any intended to be discontinued.

The areas of use shown on the second stage map will still necessarily be approximate in most cases, for it should normally be prepared before the survey information necessary to establish them precisely has been obtained. This applies especially to areas for future residential development and the uses ancillary to it, such as primary schools, local shopping centres, minor open spaces, etc., in towns and major rural centres. It will not usually be practicable to show anything but the total area likely to be required for all such uses, without differentiating between them, the most suitable land for development being selected.

Even this can only be done very approximately because calculations (see Chapter 9) based upon detailed surveys are necessary in order to arrive at a firm figure.

A rough estimate can be made by calculating the total area at present taken up by residential and ancillary development. By dividing this figure into the total population the existing gross density is obtained. Where this is excessive the additional area required to reduce it, by redevelopment at lower densities, to an acceptable figure can easily be found, and this, added to the area needed to house any proposed increase of population, makes up the total figure. It will be apparent, after reading Chapters 8 and 9 that such a method gives results which may later have to be considerably modified.

Nevertheless, this calculation is of great importance, for when an attempt is made to select land for future development it may well appear, in some particular case, that the amount of suitable land which is available is insufficient, and that a detailed check must be made. If this check confirms the original estimate it will clearly be necessary either to raise densities or, if the land deficiency is too great, to revise the regional Plan in order to provide elsewhere for the population for which room cannot be found in the town under examination.

Such calculations are neither necessary nor possible for minor rural centres. Increases of population are unlikely to take up any large area of land; all that need be done is to select an area of land suitable for development and of a size which is likely to be ample for all needs, yet not so large as to encourage scattered development. (See Chapter 17.)

Areas for development shown on the second stage map should not carry an express or implied right to carry out development anywhere within them; they should rather indicate the limits outside which permission could only be contemplated if an unanswerably strong case were established; proposals for development within them should be examined carefully to see whether they enable a reasonable programme of development to be followed.

The second stage map is primarily an interim Plan used to avoid major errors being committed and to relate individual proposals to a framework. Fig. 14 is an example of part of a second stage Regional Map.

After the preparation of the outline Plan, it will be necessary to enter upon exhaustive consultations with all the numerous bodies affected by the plan. This is part of the political aspect of Planning with which we need not be concerned, except to say that it is likely to be protracted and that the Plan may well emerge from it somewhat battered.

The method of presentation here suggested for the regional Plan is of course very different from that adopted by the Ministry in the Development Plan Regulations, which are, in this respect, I have no hesitation in saying, markedly inferior. They involve the preparation of a County Map, at a scale normally of 1 inch to 1 mile, which is a curious and unsatisfactory blend of both the first stage and second stage maps described above, but does not clearly set out nor include the full contents of either. They provide for the delineation of road proposals, the location of rural services and of the major non-agricultural uses in the countryside, but do not require areas in villages in which development is intended to be permitted to be shown, and only for those towns for which a Town Map has been prepared and is submitted at the same time as the County Map, thus entirely failing to provide for the "holding operation" which is the principal purpose of a second stage map, for proposed development areas are to be shown in outline only for those places for which they have already been worked out in detail to a larger scale. On the other hand, proposals for changes in the population and employment of towns are not required to be shown. It appears that the need to prescribe areas for permitted development in villages has at last been realised, for in Circular No. 50/57 provision is made to map development areas at a scale of 1/25,000 for villages where a limited measure of expansion is contemplated.

6-3. PROGRAMMING

Programming consists of deciding the order in which the development to implement a development Plan is to be carried out and calculating, as far as possible, the time within which each stage may be expected to be completed.

The first half of this task is relatively straightforward and, at least as regards the local programme, is no more than a necessary extension of the technique of Planning design itself; the second half is extraordinarily complicated; its successful performance depends upon the correct prediction of many trends, economic, social and technological, so that any approach to accuracy is improbable. Fortunately, the first half, as well as being easier, is a good deal more important.

Programming is important for three special reasons. First, it is essential that development of various kinds should be so co-ordinated that there is a reasonably balanced state of affairs in existence all the time. It is hopeless to stage a Plan so that, although conditions may be confidently expected to be well-nigh perfect in 1980, between 1965 and 1975 they are sure to be wretched, large numbers of people having no shopping facilities or schools reasonably near their homes and having to travel a long way to work. Most Planning involves some present sacrifice for the sake of future benefit, but this should be reduced to a minimum, not only with the simple object of making life as pleasant as possible for as many people as possible during the long period of implementation, but because no programme which involves too great a

measure of present sacrifice will be carried out but will be modified or abandoned by public demand.

Second, a target is psychologically necessary, so that if it is exceeded there will be satisfaction, and, if it is not met, disappointment and a spur to greater endeavour. Most human enterprises have to be divided into stages if the best results are to be achieved, and this is particularly so with those which may stretch over the greater part of a human lifetime.

Third, in order to prevent capital lying idle, it is necessary to have a fairly clear idea of the time at which any particular development is likely to become necessary, so that where public acquisition is involved this shall not be done prematurely.

Programming needs to be carried out at scales and in degrees of detail comparable with those of the development Plan itself. At the regional scale it is necessary to know in what order and quantity the various steps necessary to redistribute population and industry are to be taken.

Programming can be implemented, so far as public development is concerned, simply by the various public bodies involved harmonising their activities with it. With private development all that can be done is to release appropriate amounts of land at the right time and the right place and to resist premature development.

It is not possible entirely to separate the programming of the regional and of the local Plan. At first sight one might suppose that it should be possible to decide the places within the region in which development should take place first, and the amount to be allocated to each, in order to secure the most satisfactory interim distribution of population and industry, but this is complicated by two powerful factors. First, the mobility of building and other constructional labour within a region is far from complete, and, therefore, the speed of development in a particular town must necessarily be dependent in part upon the strength of the local labour force. Second, optimum distribution of population and industry must, in some cases, wait upon the relief of bad living conditions. Thus, a town from which it was intended to remove a considerable amount of population might nevertheless require a great deal of development to be carried out at an early stage because of the large number of houses unfit for habitation which it contained.

The relative importance of increased production and reduced waste attributable to improved location of population and industry, and of greater health and happiness, due to the amelioration of housing conditions, is a matter which cannot, of course, be determined entirely in the light of land Planning principles, but must largely be a matter for political decision.

While, therefore, it is most desirable to prepare a regional programme designed to remedy defects in the balance of population and industry in the approximate order of their magnitude, it will have to be recognised that such a programme is likely to need substantial revision as the detailed needs of individual towns become known, and that the incomplete mobility of labour (as well as local feelings!) will make it necessary for some development to be going on all the time in every town rather than for work to be entirely focused on a few places in the early stages.

The regional programme is influenced not only by the rate of building

construction possible but by other development required to implement it. For example, the increase of population proposed for a town may be impossible to attain unless it is accompanied by an improvement of transport routes so radical as to be incapable of achievement for many years. Similarly, the building force of a town may be adequate to erect large numbers of buildings, but these may also necessitate the construction of a new sewage works or reservoir beyond the capacity of local labour to carry out.

The regional programme must be concerned not only with the order in which population and industry are redistributed but with the consequent rearrangement of central services needed. Every increase of population within the service area of a place throws some additional burden on its supply services; though they will normally be sufficiently flexible to prevent this burden being seriously felt for some long time, additions will eventually be required because of the increased importance of the place as a centre, irrespective of any increase in its own population.

The regional programme, as it affects the rural parts of the region, poses less difficult problems of decision than those of the urban parts, because the scale of development is smaller and the interaction of different operations less complex, but the implementation of such a programme may present appalling difficulties.

The programme of rural development aims at providing central services of the simpler kinds as quickly as possible for those areas whose deficiency is greatest; this will frequently entail, paradoxically, provision for increased *population* in certain centres, so that there may be sufficient local support for services supplied to a large and sparsely populated area. Schools, village halls and shops will be the forms of building development most required for increasing services, while local increases of population will often be dependent upon the provision of piped water and sewage disposal works.

Exceptionally bad local housing conditions may upset the optimum order of development for improving the distribution of services, and the urgent need, in the interests of agriculture, to build some houses at once in nearly every village will further modify the programme. On the other hand, since the building labour required can never be found from within an individual rural centre, choice of location for development as between individual villages will be less governed by immobility of labour than in the case of towns, though it will still be a factor to reckon with in respect of the rate of rural development possible in different parts of a region.

Conclusion

The foregoing account may, perhaps, suggest that the preparation of a regional plan is a somewhat haphazard process, and that there can be no certainty of producing a sound set of proposals, but this would hardly be a correct assumption. A thorough survey of existing conditions, if its findings are incorporated in the Plan, is in itself a safeguard against serious errors. A multitude of Government Departments, local authorities and statutory bodies, as well as private persons and associations, all have the opportunity of offering comments and criticism either at the public inquiry into the Plan or beforehand, and the Minister has at his disposal a wealth of technical advice upon which to draw before deciding whether to approve the Plan.

Hence there is every likelihood that any fundamental error in the proposals will be detected and exposed by one or more of the various interests whose activities would be prejudiced by it. It is true that a choice may sometimes have to be made between two opposed policies, but this should only occur when the technical evidence available shows the balance of advantage to lie evenly between them, in which case it is unlikely that either will lead to disaster, however much this may be prophesied by supporters of the opposite policy.

CHAPTER 7

THE PLANNING OF TOWNS

7-1. GROWTH AND CHANGE

WE HAVE SEEN in Chapter 4 that human settlements form a hierarchy of service centres. At some point in this hierarchy the settlement ceases to be a mere village and becomes a town. For the purposes of town, as distinct from regional, Planning it is less important, though still necessary for some purposes, to know the position occupied by a settlement in the service hierarchy than to appreciate its essential structure and internal functioning. Settlements which may, for Planning purposes, be considered to be towns are those which have or which it is intended shall have a physical structure sufficiently large and complex to involve problems concerning the location and spatial relationships between land uses and the form of the road system.

Professor Griffith Taylor, in "Urban Geography", analyses a large number of human settlements and places them within a hierarchy based primarily not upon the central services they render but upon the complexity of their structure. This hierarchy may be summarised as follows, using Professor Taylor's nomenclature :—

Infantile. In this type of settlement there is no separation into zones of different kinds of land use nor of dwellings for different social classes (e.g., the ordinary English village).

Juvenile. Shops are separated from houses into definite groups but few factories exist (e.g., many urban villages).

Mature. Houses are separated into areas of distinct types, commercial and industrial areas are fully formed (e.g., fully-fledged towns).

Senile. Extensive areas of the town are in a state of physical decay and the prosperity of the town has declined (e.g., town in the depressed areas).

These are the main stages, but Taylor distinguishes other minor divisions; thus he describes as *sub-infantile* a settlement with only one street, and that ill-defined, and as *adolescent* one in which the house types have begun to be segregated but the first-class ones have not yet formed a distinct area.

It is important to realise that settlements may not necessarily pass through all, or even any, of the stages enumerated. An ordinary English village may have remained at the infantile stage for many hundreds of years, while, on the other hand, some industrial towns have in little more than 100 years passed through all the stages from infantilism to maturity and already show signs of senility, although an ancient city which has long been mature may bear no marks of senility. Equally, a change from one stage to another does not necessarily denote an *improvement*, even when the change is not to senility. The change from infantilism to juvenility or from juvenility to maturity may mean a change from a convenient and well-balanced arrangement to one

which is lop-sided, congested or unbalanced. In the latter case, particularly, a town centre which was perfectly adequate in the juvenile stage is likely to become hopelessly crowded and inconvenient during maturity.

A Classification expressed in social rather than physical terms is given by Lewis Mumford, who has perhaps provided more food for thought on the basic aims of physical Planning than any other living writer; as the disciple of Patrick Geddes, he has clarified and elaborated the latter's teachings.

In "The Culture of Cities" Mumford distinguishes six stages in state and city development and decline, taking examples from many different civilisations:

- (1) *Eopolis*. The village community with an economy based upon agriculture.
- (2) *Polis*. An association of population with common aims and beliefs on a single site. Beginnings of specialisation and mechanisation. Theoretical knowledge begins to be distinguished from empirical knowledge.
- (3) *Metropolis*. The city which emerges as the predominant community in a region. Specialised trade develops with other regions.
- (4) *Megalopolis*. The first stage in decline. Concentration by the rulers of the city upon size and power; everything subordinated to the accumulation and display of wealth. Aggressive military expeditions; standardisation of artistic productions and the drying up of originality.
- (5) *Tyrannopolis*. Parasitism, exploitation of colonies and hinterland; periodic trade depressions intensify; corruption in public administration. Gap between producing and spending classes widens; extortion of "protection money" by racketeers; growing militarism.
- (6) *Nekropolis*. War, famine and disease take command; civic authority collapses; physical decay in the city, which becomes an empty shell and finally vanishes; surviving inhabitants take to the countryside and return to rural methods of earning their livings. Recovery and rebirth of the city may follow after a time.

It is interesting to compare this classification with Griffith Taylor's. Two important principles are inherent in it: that there cannot be satisfactory town Planning in a basically unsatisfactory social order and that danger lurks in excessive accretions of size. The terms, as with Griffith Taylor's, are, as regards time, relative and not absolute; there are large parts of the world in which Eopolis is still supreme, although in past ages countless cities have passed through the whole cycle and disappeared into Nekropolis.

The social structure of a town may be as complicated as or more complicated than its physical structure, and the two have close, though not simple, connections.

Many writers have drawn attention to the process of invasion and succession which occurs in many growing towns and which results in the poorer quarters nearer the centre spreading to more prosperous areas and

driving the better-off residents to the outskirts. The first-class houses of one decade become the second-class houses of the next decade.

Invasion and succession are enlarged upon by Gist and Halbert in "Urban Society". They develop the theory of the American sociologist, E. W. Burgess, that towns normally grow outward in concentric rings from the centre. Typically, these rings form a series of distinct use and class zones which, starting from the centre, and modified to apply to the larger British towns and cities, are as follows:

(1) *The central area* of the town, in which the principal shops, offices, warehouses, civic buildings and places of amusement are concentrated. Competition for land is very acute and rents, therefore phenomenally high. This leads to very intensive building development, the proportion of the site covered often approaching 100 per cent., and high buildings are prevalent. It becomes unprofitable for private enterprise to provide services such as car parking which are essential for the satisfactory functioning of the area but which give a small financial return per unit of land. Equally, the burden on the public purse if the municipality steps in to purchase sites for the provision of such services becomes unendurably great.

A peculiar feature of the central areas of many towns is that residential use by the very rich in blocks of luxury flats and by the very poor in slums often continue side by side where multiplicity of ownership, or other complicating factors, have prevented full utilisation taking place.

These slums extend outwards into:

(2) *An area of suspended animation and deterioration*, in which, owing to the prospect of expansion of the central area, site values are very high, but, because intensification of land use is not yet practicable, the value of the buildings may be very low. These buildings are frequently allowed to deteriorate because the owners, expecting profit from redevelopment, do not find it worth while to maintain them.

A certain amount of business, industry and storage is commonly found in this area, generally for purposes which need a considerable amount of land, can utilise existing buildings, but do not require a very central position sufficiently urgently to make it worth the promoters' while to pay the much higher rents demanded in the central area. This area of transition normally displays an air of the utmost decrepitude, and it is not uncommon to find within it small areas which, because of their unfavourable situation or detailed physical characteristics, have been left as islands in the outward flow of development, and which remain as weedy patches upon which garbage is dumped and rickety hoardings display advertisements.

The area generally includes a number of buildings which were the mansions of a previous generation, and which have either become occupied as flats without the structural alterations and additional sanitary and cooking facilities necessary for satisfactory conversion or have been put to some non-residential use.

(3) *High-density small houses* which have not degenerated into slumdom, but which, in the inner part of the area, developed before building by-laws were applied, form a dense and confused mass. Beyond this lie the no less

drab but slightly more spacious "by-law" houses and the villadom, at substantially lower density, of the years of the twentieth century before the First World War. Within the whole of this area shopping areas and public buildings occur spasmodically and have often been provided in a makeshift fashion, e.g., by the rough-and-ready conversion of the ground floors of a row of houses into shops to meet a local demand. Usually, however, the great majority of such buildings are placed in long rows along the main radial roads leading from the town centre because of the trade accruing from the large volume of vehicular and pedestrian traffic which uses these roads.

Open spaces within this area are normally either almost completely absent or else in the form of large units on its outskirts, sited without regard to easy accessibility for the inhabitants of the whole area.

(4) *Inter-war housing.* Density is much reduced; the great bulk of this development is in the form of small pairs of houses of stereotyped design, larger pairs and detached houses occupying somewhat segregated positions; provision of shops, public buildings and open spaces is still spasmodic; often development has now reached so far as to engulf former villages, the shops of which are added to, and form local centres. In this area the "council estate" makes its appearance, and occupies sites similar to, but often in some way inferior to, those occupied by speculative development.

(5) On the periphery lie villages and hamlets sufficiently close to the town to provide attractive sites for the homes of the well-to-do in the form of additional houses or by the invasion and conversion of existing cottages. Small groups or ribbons of isolated dwellings fulfil a similar purpose.

The theory of ring growth is correct in general terms. Certainly the general direction of growth is outwards from a centre; certainly the pressure of development also drives the more prosperous outwards to relatively uncrowded surroundings with unpolluted air, leaving their former abodes to be occupied, altered or unaltered, by the less fortunate, but it is rare for the process to be regular. Development follows the lines of least resistance, topographically and economically, and, in addition, the location of industry exercises an influence over urban growth which prevents it being entirely concentric. There is generally a greater weight of development in the quadrant or quadrants of the town in which the majority of the industry is sited.

The sites for industry established during the nineteenth century were usually determined by definite factors—the location of minerals, of transport routes or of power—and the mass of housing required for the workers in the factories which were built had to be close at hand. Before the introduction of public transport or the bicycle it was imperative that this housing should be really close to the factories.

This is probably the main reason for much nineteenth-century housing being sited on steep slopes which no modern developer, public or private would consider because of the expense and difficulty involved. A second reason is that this development took place at a time when the cost of land compared with the cost of building labour was very much higher than it is now, so that the developer was not so worried by the expense of developing difficult land.

There is no typical location for industry in relation to other zones except that, as already noted, the bulk of the workers' houses will be found close to it. Industry may be in one, two or more concentrations located in accordance with its economic requirements, but, on the other hand, it may not be in any concentrated mass but may be fragmentarily dispersed (see Fig. 15 (vi)) through zones (2) and (3) with outlying units in zones 1 and 4, or the basic industry may be concentrated, with service industry and industries linked to the basic scattered wholesale.

A clear understanding of the tendency of development to follow lines of least resistance is essential. Though it may often be necessary for Planning action to be taken to curtail the extent to which development would spread in a particular direction in the absence of control, or even to seek to reverse such trends, it is obvious that more effort is needed and more opposition to be expected when this is done than when it is only necessary to guide and mould development which would have taken place spontaneously in much the same way without control. However imperfect the results of uncontrolled development, most of it does at least take place at a high enough level of efficiency to be justified by the rough measure of profit.

It is generally true to say that the value of land for any particular use is the resultant of its position and its physical characteristics, and this is as true of agricultural land as of shops. The agricultural value of land with quick and easy communication to markets may, for example, be as high as that of more fertile land less conveniently situated, and this is reflected in the rents a farmer will be prepared to pay. Similarly, the value of steep and broken land, costly to develop for housing, may nevertheless be as great as that of flat land which is cheap to develop but further from a town centre or area of employment. This is so because, once developed, people will be willing to pay higher prices for more conveniently located houses, and these higher prices enable a developer to get as good a return for his outlay as that given by the lower prices secured for houses more remotely situated on land less costly to develop.

Example: Remote land easy to develop

| | | |
|--------------------------------|-----|--------|
| Cost per house to developer... | ... | £1,500 |
| Selling price realised ... | ... | £2,000 |
| Profit ... | ... | £500 |

More Central land difficult to develop

| | | |
|--------------------------------|-----|--------|
| Cost per house to developer... | ... | £1,800 |
| Selling price realised ... | ... | £2,300 |
| Profit ... | ... | £500 |

A developer who had correctly estimated the possibilities of each site would be willing to pay as much for one as for the other.

To take an extreme and obvious example where position is much more important than physical characteristics, the value of a piece of land for shops in the centre of a large town would be high even if it had highly unfavourable physical characteristics. The value of land in the open country for shops is nil, however flat and well drained the site. In general, the value of land

for business uses depends much more upon position and much less upon physical characteristics than it does for residential or industrial uses.

Despite the relative costliness of land in comparison with labour in the nineteenth century, during which so much urban development took place, it was of course, other things being equal, cheaper to develop the flatter land. Thus, in the case of sites where there is considerable change of levels, there is a constant tug-of-war between the advantages of flatness and of central situation. Development tends to spread outward, following the easiest gradients and leaving elevations and depressions undeveloped until a distance is reached at which the advantages to the developer of building further out on level land are balanced by the advantages, in terms of rent or selling price obtainable, of building closer to the centre on sites physically less favourable. (See Fig. 15 (v).)

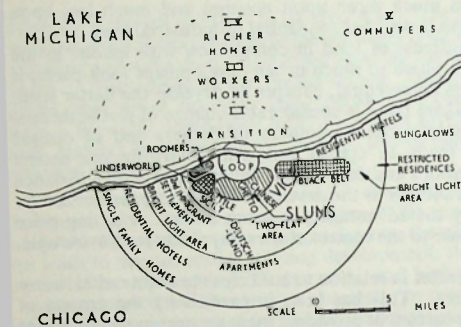
A similar tug-of-war operates in relation to land close to main radial routes and that remote from them. This has been intensified by the growth of public transport and of the custom of providing main services in such roads at public expense. In the absence of complicating topographical factors, development will tend to stretch outward along radial roads, leaving the back land undeveloped, until a point is reached at which the disadvantage of the distance of the radial development from the town centre is balanced by the indirectness of communication between the back land and a radial route. (See Fig. 15 (iii).) Once the back land has been developed, radial development may continue to stretch outward for a time until a halt is once more called while more back land is developed. This may happen several times during the growth of a town. At any given time, therefore, the shape of a growing town, where radial roads spread out from the centre, is likely to be that of a star.

There is a very strong tendency for main roads to run as straight as possible to town centres from other towns and surrounding villages, to form an "umbrella" pattern, but roads too follow lines of least resistance, as can be seen in Fig. 15 (iv).

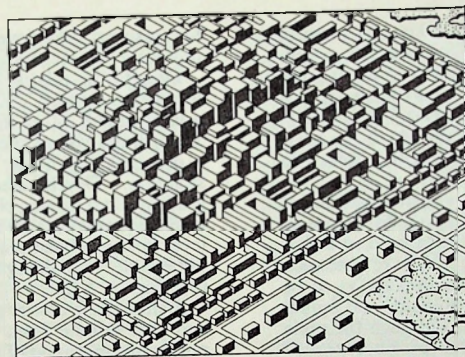
One other aspect of town structure must be briefly investigated. The "normal" town is developed in such a way that the intensity of use—the volume of buildings per unit of site—rises steadily from periphery to centre with but few exceptions. (See Fig. 15 (ii).)

This often results in the exclusion from central areas of essential but not very intense uses which cannot earn sufficient to pay high rents. This impasse, it should be clearly understood, arises from quite different causes from those which at present prevent rapid redevelopment, causes which are not inherent in physical limitations but which arise from the pecuniary basis of our civilisation. The private ownership of land involves the investment of capital, which, in turn, must be justified by putting it to a use which secures a rate of return, in the shape of profit or rent, comparable to that obtained from other forms of investment, or, alternatively, the compensation of the owner and/or occupier of the land at crippling loss if it is purchased by the public in order that it shall be put to its most useful purpose socially.

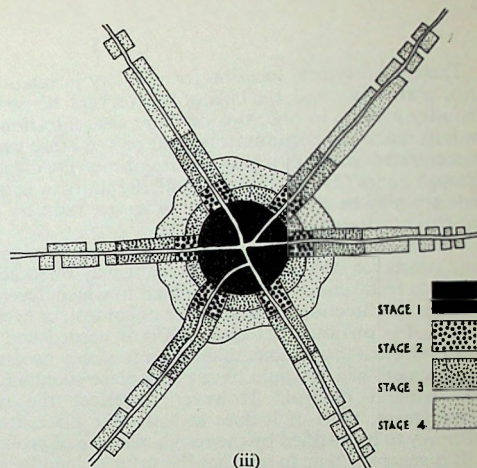
The Town and Country Planning Act, 1947, greatly reduced the obstacles to satisfactory development arising from the differential values of unbuilt-



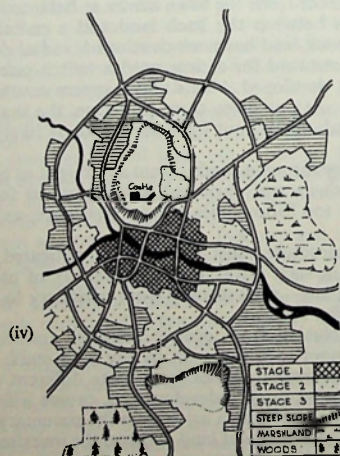
(i)



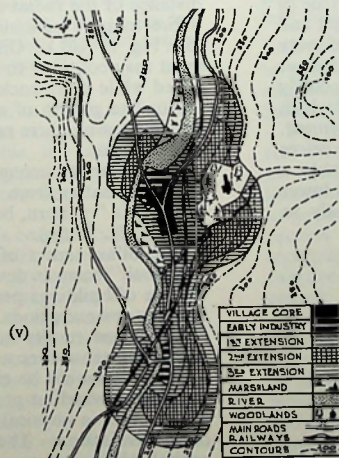
(ii)



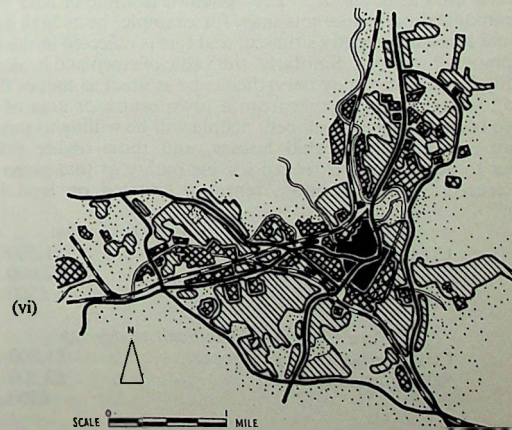
(iii)



(iv)



(v)



(vi)

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FIG. 15 UNPLANNED TOWN FORMS

- (i) Social and racial distribution in Chicago. (After Gist & Halbert.)
- (ii) "The Urban Pyramid". Typical progressive increase of site coverage and building heights as the town centre is approached.
- (iii) The typical "octopus" or "starfish" form of unplanned town growth where there are no natural or artificial obstacles to development.
- (iv) Where obstacles are strong and numerous great distortion of form occurs.

- (v) The typical form of development in a narrow valley with steep sides, produced by the tug of war between central but difficult and easily developable but relatively remote sites.
- (vi) Burnley. Industry cross-hatched, residential oblique hatched, town centre solid black, open spaces etc. stippled. A somewhat extreme example of industry widely scattered instead of grouped in a particular part of the town.

on land, but signally failed to solve the problem in respect of developed areas.

It is an interesting thought that this steadily rising pyramid of intensification of land use by no means necessarily represents the best overall social or economic arrangement. In terms of convenience, ease of transit and free circulation of traffic, it might often be desirable at the very centre of a town to have a comparatively small area of very low intensity of use—open space, with the area of highest intensity of use immediately adjoining this. The latter would then have a perimeter and hence ease of access greater than if it were at the very centre. Outside the central area there is no clear reason for having the most densely developed residential areas nearest the centre; a fairly uniform density throughout the residential areas, punctuated by small patches of much higher density located in relation to topography rather than the town centre, might often be preferable.

7-2. TEXTURE AND STREET PATTERN

The texture of a town is roughly expressed by the overall density of the developed area, typically between 10 and 30 persons per acre, but this, of course, only tells one whether density is generally high or low; it conveys no information as to whether, for example, a low overall density contains patches of dense development offset by other patches of exceptionally low density, or is the result of uniformly, or almost uniformly, low density. This may make all the difference to the character of a town and its future needs.

The low overall density, of, for example, Tunbridge Wells, is due to its large common, which penetrates to the very heart of the town, and to the considerable number of houses with very large gardens indeed, between 2 and 5 acres in extent. These, together, give the town an air of pleasant spaciousness delightful to the visitor or to the more favoured of its residents, but the very low residential densities of parts of the town exist at the expense of a very substantial congestion in other residential areas. The total acreage of open space may not in itself be an accurate reflection of its adequacy, though it will certainly affect the visual character of the town. Use and distribution are, socially, much more important.

On the other hand, Sevenoaks, not far away, which also has a remarkably low overall density, has a totally different character. There are no very large open spaces within the built-up area, though Knole Park is close by, and few houses with enormous gardens, but, apart from some old houses along and near to the ancient High Street and a tiny area of industrial housing to the north, there is no really high density housing at all.

Quite sharp differences in density may be admissible and even desirable, indeed, too little variation is likely to induce flatness and boredom; but such variation should be intelligently sought, not fortuitous. Reference has already been made to the almost universal rule of increasing intensity of land use towards the centre of the town, and doubts cast upon its inevitability. Thus, instead of placing high density flats close to the town centre and developing all outer residential neighbourhoods at a low and nearly uniform density, there is much to be said for providing some high density flats in each neighbourhood to provide contrast. We are, to make the point again, too

slow to break free of the assumption that the economics of competitive land development should govern town planning.

Nevertheless, within limits, the policy of intensifying land use towards the centre is reasonable. The town centre itself is, of course, the area of greatest activity, and hence of greatest density. It is safe, also, to assume that quite a large proportion of the single people and childless couples whose needs are satisfied by a flat are those who will use the cultural and entertainment facilities of the central area most and who will welcome a location close to it. Equally, the comparatively small number who desire a really big garden—an acre or more—and who have either the time to cultivate it themselves or the money to have it cultivated for them, are, almost without exception, those who least need a central location and can appropriately be housed on the outskirts of the town. It is obvious that, in a town whose shape approximates to a circle, the total amount of land available at approximately the same distance from the centre increases as the distance from the centre increases.

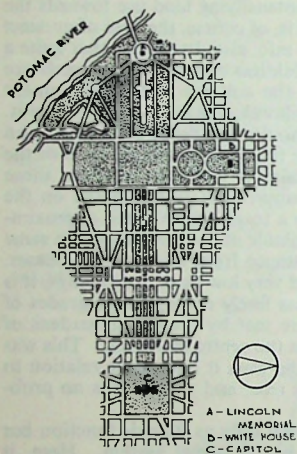
But, between the extremes of very high and very low density dwellings, it is now fallacious to assume that people possess finely distinguished grades of wealth and leisure, and that their needs are met by providing gardens of gradually increasing size as the distance from the centre increases. This was always a dubious assumption but between the wars it bore some relation to the truth. Now it is becoming less and less true, and there seems no probability that the tendency will be reversed.

Towns are classifiable into various types, not only as regards function but as regards physical pattern, as evidenced by the street system. Here, it should be made clear, we are dealing with the pattern formed by the main streets, exclusive of that of the minor ones, which are discussed in Chapter 16. While the two patterns are frequently similar and complementary, this is by no means always so, and indeed the two may conflict, with consequent distortion and confusion. (See Fig. 16 (v).) This distinction between the two patterns needs to be emphasised because, in small communities, including most ancient examples, there is no strong distinction between major and minor roads, and, hence, only one pattern to discuss.

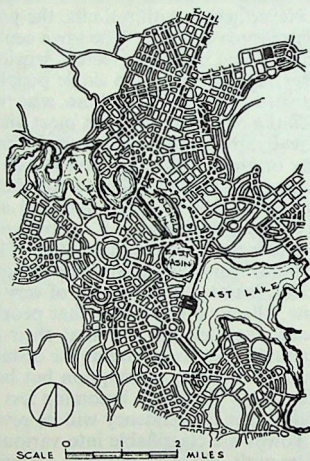
The main difference between street patterns is between those which have grown up naturally and gradually without conscious design and those which have developed rapidly, and which have therefore unavoidably involved a degree of conscious design in order to make sufficient land available quickly.

Of the first kind, by far the commonest is the radial or "umbrella" pattern already mentioned, the regularity of which may vary considerably, but which, in its purest form, consists simply of the most direct routes between the town and other places, all converging toward the town centre.

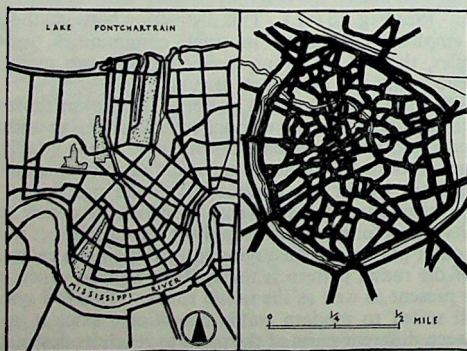
A variant of the radial pattern is the spider's web, in which one or more ring roads are present as well as the radial roads. This is a system which is peculiarly well suited to modern traffic conditions, since it enables traffic travelling between different parts of the town to reach its destination without passing through and so increasing congestion at the centre. It is therefore regrettable that examples of spider's web patterns are comparatively rare. Too often development has proceeded too far before the need for lateral roads has been realised, and this is understandable in the case of unplanned towns,



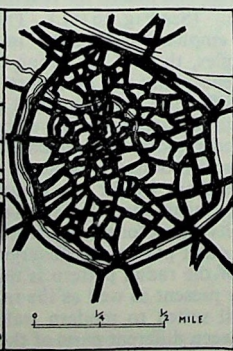
(i)



(ii)



(iii)



(iv)



(v)

FIG. 16 STREET PATTERNS

- (i) The central part of Washington, an artificially created capital.
- (ii) Canberra. Another artificially created capital.
- (iii) New Orleans. A convenient example of a waterfront town which shows the effect of curved and of straight waterfronts upon the road system.
- (iv) Soest. Extreme formlessness of road system.
- (v) Where gridiron street patterns oriented to converging main roads meet the result is chaotic.

since the *main* stream of traffic and attention is bound to be directed towards the centre.

Sometimes, however, happy accidents or the cessation of need for peripheral fortifications have resulted in the construction of ring roads. Paris, Vienna and Moscow are Continental examples, while Norwich is perhaps the best example in this country.

A variant of the spider's web plan occurs in the case of water-front towns, where the focus of importance is not a centre of strictly limited size but a length of sea, lake or river frontage. Where the waterfront curves outwards from the town it is natural for roads to be made parallel to it and others radial to them. Where, however, the water-front is of irregular shape great distortion may result and the simplicity of the road pattern be lost. (See Fig. 16 (iii).)

Yet another important type of natural road system is the amorphous, in which no distinct pattern can be discerned. This may occur where natural or pre-existing artificial features cause a radial pattern to be altered out of recognition. It may also be seen in towns which have originated as medieval walled cities in which the need for relative self-sufficiency and for a compact, and thus easily defended, site prevented the normal centripetal tendency of the radial pattern from developing, and in which the pattern and orientation

of several important parts of the town was carried out quite independently, without consideration of how they were to be linked. This cannot wholly explain, but gives some clue to the fantastically tangled street plan of many such towns. It is as if the several units of development flowed towards each other like waves, their meeting-place becoming the site of turbulence.

In the case of towns which have developed comparatively rapidly, either as the result of industrialisation or to meet military needs, the rectangular plan is by far the commonest. It has persisted from the time of ancient Egypt, through the Greek and Roman Empires to the chief cities of the United States and the British Commonwealth.

The disadvantages of the grid-iron plan are obvious :

- (1) A destination which does not lie on the same road as the point of origin cannot be reached without traversing two sides of a triangle.
- (2) The arrangement is hopelessly inflexible. It cannot be varied successfully to take account of topographical irregularities without confusion and inconvenient building plots resulting. This can be seen very clearly when a rectangular network of *minor* roads is superimposed upon converging major roads. (See Fig. 16 (v).)
- (3) It is abominably monotonous, not only because variety of layout is impossible, but because each street stretches to visual infinity.
- (4) Direct crossroads, fatal to safe traffic conditions, abound.

On the other hand, of course, the grid-iron system has the merits of providing regular shaped building sub-divisions which can be developed economically, and of needing no skill to design and set out on the ground.

Some towns have been laid out to elaborate patterns such as Washington, Canberra and New Delhi (see Fig. 16 (i) and (ii)). These have frequently been artificially selected capitals or court towns, and the designs used bear a striking similarity to each other, non-rectangular geometrical shapes being predominant. Certainly these designs have many merits compared with most of the arrangements so far described; they are comparatively well adapted to modern traffic circulation (though the plan for Washington has caused difficulties in this respect), they are far more flexible than the rectangular pattern, and they have a unity and logic which makes some appeal; but they are often needlessly elaborate, and have a formality which can really only be appreciated from the air. The functions they perform could generally be more simply and equally well discharged with a less mathematically disposed layout. When possible, it is well to have a street pattern which can be readily memorised; both spider's web and grid-iron patterns are essentially simple, and it is not so easy to lose one's sense of direction within them as in the case of more elaborate compositions.

7.3. DISTRIBUTION OF LAND USES

There are five distinct parts of any planned town, and even in unplanned towns they can be seen, although not usually with the same clarity. These are as follows :

The Town Centre. This is the area in which the commercial and admin-

istrative and some aspects of the social life of the town take place in their highest and most complicated form, and in which the most important central services supplied by the town are made available. The essential constituents of the central area are shops supplying occasional needs, offices, banks, administrative buildings—the town hall, etc.—and important buildings for social and cultural purposes, such as the principal library and museum, the theatre, and the largest churches. A good deal of wholesale and retail storage accommodation is likely to be required.

The industrial Area. As already noted, this may be split into a number of parts and is the area in which the manufacturing industry and the largest service industries are located, together with electricity and gas generators and large-scale warehousing of bulky goods.

The residential Area. This is the area in which people live; although it is principally made up of dwellings and gardens, it includes many other uses: local shopping, primary schools, local open spaces, and the smaller service industries.

Chapter 13 is devoted to discussion of the Residential Neighbourhood Unit idea. This is so important a concept in connection with town structure that it must also be briefly mentioned here. In a town of any substantial size the distance between perimeter and town centre creates a demand for local facilities conveniently situated to serve the inhabitants of the part of the town immediately adjoining each rather than the town as a whole. Shops and primary schools are the most obvious examples of these facilities. The area which each facility serves may be different, but even in an unplanned town there may be sufficient congruence between the service areas of different local facilities—particularly where railways, parks or other dividing features split the town into physically distinct units—for a recognisable system of sub-units, districts or neighbourhood to come into existence, the centre of each acting as a centre for services of a lower order than those provided by the town centre. This may be recognised by them becoming known, informally at least, by particular names, and may be reflected in the system of division of the town into wards.

Where the division into sub-units is particularly distinct, each may bear something of the same relation to the town centre, in terms of the services locally supplied, as do the villages surrounding the town, though I hope that this will not lead anyone into the error of supposing that the neighbourhood idea is a kind of romantic attempt to introduce a village green atmosphere into town life, as has sometimes been suggested. It is in fact simply the rationalisation and completion of an extremely strong tendency based upon real needs, although in unplanned towns the attraction exerted by main radial roads and the effect upon development pattern of land values often distort it almost to the point of meaninglessness.

Open Space. This is a term which is used very loosely but generally refers to all land which is used for purposes which do not require many buildings, and which enable it to be left substantially in its natural state or to be treated so that it has visually pleasant qualities.

Within the category of “open space” one must first include parks, in the

widest meaning of the word, and playing-fields. Cemeteries and allotments are quite often so described and also secondary schools, hospitals and other institutional buildings with extensive grounds. Small areas of allotments, children's play spaces, and small rest parks are, on the other hand, frequently reckoned as part of the residential area along with the curtilages of dwellings.

In my view "open spaces" should properly be applied only to parks, playing-fields and those areas of undeveloped land larger than the purely incidental open spaces within a residential layout to which the public have access. Secondary school sites, hospitals, and other institutional sites should be categorised separately, and allotment land, unless very large in area, included with the residential area, while cemeteries are quite different from any other kind of open space.

The Town Periphery. This includes all the land surrounding the town, the use of which is influenced directly by the town, but which cannot be considered as part of the town itself. Such land would include market gardens and nurseries and golf courses.

Clearly, on a wide interpretation of the term "open space," the only difference between much of the periphery and much of the open space will be its position. In fact, where the principle of running wedges of open space from the circumference of the town to its centre is adopted, they will merge into each other with no definite break.

Another important part of every town, in a different sense, is its transport system and, particularly, its road system, and it is frequently the part most in need of improvement.

7.4. TOWN PLANNING THEORIES

Mumford has modified another of Geddes's classifications, that of the stages through which human civilisation has passed and is passing. The terms used by Mumford are as follows :

Eotechnic. The beginnings of civilisation founded upon mechanical power, using wind, water and wood for power, and wood as the chief building material. Existing in Europe between the tenth and eighteenth centuries A.D.

Paleotechnic. The age of coal and iron economy, the steam engine, steamship and railway, mass production processes in manufacturing industry. Dominant in Europe during the nineteenth century.

Neotechnic. Emerged towards the end of the nineteenth century and is based upon the use of electricity as power, upon light metals such as aluminium and copper, rubber and plastics. Elaboration and perfection of many kinds of machinery; invention of the internal combustion engine and the aeroplane.

Biotechnic. The civilisation of the future, which Mumford sees as a development from the purely mechanical achievements of the Neotechnic age, will, in his view, involve the co-ordination of the many isolated, and even conflicting, Neotechnic devices and organisations, the application of biological knowledge to technics, and the enlisting of technology in the service of life rather than in the service of rivalry and personal enrichment.

Mumford points out that although Neotechnic inventions and industrial processes are at present generally dominant in Western Europe, the towns in which these processes are carried on are, in the main, relics of the Paleotechnic age. He claims that some essential parts of cities appropriate to the Biotechnic age can only be provided if a pecuniary economy is abandoned.

From this point of view modern Town Planning may be regarded as an attempt to formulate principles for the creation or modification of towns which will be fitted at least for the Neotechnic age, and which may be expected to be capable of further successful adaptation to the Biotechnic age. It is important to realise how wide a gap there is between the motives and assumptions of modern Planning, based upon social requirements, and those of royal, dictatorial, military or merely pictorial Planning, even though there may be resemblances between the end products.

There have been numerous attempts to work out forms which will result in a town becoming a balanced organism rather than a mass of isolated or mutually hampering elements. Theories of town buildings concern themselves with two main aspects—size and shape.

First place must be given to the teaching and efforts of Ebenezer Howard. Howard's ideas grew from and clarified the tentative gropings towards a civic theory of nineteenth-century philanthropists and reformers. He was appalled by the conditions of life in the Paleotechnic industrial town at the end of the nineteenth century and regarded its very size as a factor severely aggravating to these conditions.

In his book "Garden Cities of Tomorrow" (re-published in 1946 by Faber and Faber) he contrasted the advantages and disadvantages of town and country: the varied social life possible in the town, and the comparatively high wages obtainable there, but accompanied by squalor, atmospheric pollution and savage inhumanity, as against the beauty of the countryside, its pure air and natural mode of life, but also its lack of social variety and poor wages. The remedy appeared to Howard to lie in a town of limited size which would combine the advantages of both town and country with the disadvantages of neither.

Howard's well-known simile is of town, country and town-country, each acting as a magnet, drawing people towards it because of the attractions it offers, with town-country offering the best bargain, counteracting the stream of new population which was then still flowing to the cities in undiminished volume and adding to their congestion and difficulties.

Howard's idea of town-country was a garden city with a population of about 30,000, each family with its own house built on a plot of an average size of 20ft. by 130ft. The town was to be a satellite of the great city in whose service area it was situated, but was to have its own industries. The site of the garden city, of some 1,000 acres, together with a peripheral belt of 5,000 acres, was to be in the ownership of the town so that its citizens would reap the benefits of appreciation in land values due to development. Growth would not take the form of peripheral accretion but of further satellite towns, each with its own green belt, until eventually the parent city was ringed by satellites.

Howard's ideas have remained fresh and valid for half a century. Without

any governmental aid whatever, they have been exemplified with a great measure of success in Letchworth and Welwyn Garden Cities and are basic to the New Towns policy at present being pursued; they have indeed become so thoroughly assimilated into Planning doctrine that they are today frequently expressed and acted upon by people who do not even know their origin.

Like all inventors and reformers, Howard has suffered from misunderstanding and distortion of his theories and by his terms being exploited and applied to forms of development which they do not truly describe. Between the wars many developers found that the term "garden city" had a selling value, and applied it to development which bore no relation to Howard's Garden City. In his preface to the new edition of "Garden Cities of Tomorrow," Sir Frederic Osborn has emphasised this debasement of Howard's coinage.

Howard did, of course, suffer to some extent from the tendency to oversimplify, which is an unavoidable, even perhaps a necessary, trait to the reformer. He ignored the advantages and pleasantness both of the larger village and of the large city which is not yet swollen to inhuman size, and did not sufficiently take into account the immovability of many kinds of industry or the profoundly modifying influences of topography. Perhaps, too, his "magnets" notion is too crude to have much value when the need for a graduated hierarchy of settlements is realised.

Reformers of town structure have mainly opted for small populations—Howard, 30,000; 100 New Towns Association, 50,000; New Towns Report, 30,000—50,000. The reasons for this seem sensible and are threefold.

In a town of this order of size the population is sufficiently large for all kinds of people to find congenial companionship and form associations devoted to special interests. Institutions of most kinds can be supported. But in the very large city a dreadful impersonality emerges; the individual is apt to become an anonymous unit whose death or disappearance is hardly remarked upon; civic leaders represent too large a body of citizens to be effective representatives.

Second, as regards physical size, a town of 50,000 people at an overall density of 20 persons per acre occupies a circular area with a radius of only a mile, which brings every resident within easy reach both of open country and of the town centre.

Third, Lewis Mumford has suggested that, for reasons which are obscure, beyond a size of 40,000 to 50,000 a town becomes incapable of reproducing its own population so that it is continually declining, and must therefore continue to draw immigrants from outside.

We must be careful not to arrive at false conclusions by comparing facts which are not truly comparable. The inhumanity, formlessness and apparent comparative infertility of the Paleotechnic large town need not necessarily obtain in a large town developed or redeveloped according to Biotechnic principles. As we have seen, too, in Chapter 4, the present level of population can only be sustained in this country at the same time as extensive tracts of open country if large cities are retained.

Various suggestions have been made for the establishment of towns which, by reason of their shape and the relationship of their functions, have been

considered by the authors to avoid the faults of the Paleotechnic city, and which are radically different in form from those with which we are familiar.

Among the best known of these is that of Don Arturo Sonia y Mata, who, in 1882, propounded the idea of a lineal city of 30,000 people. He based his proposals on the principle that transport routes should determine city designs and that the city should be designed in advance of development. The form he proposed was a wide and nearly straight spine road down the centre of which ran railways; access to development was obtained by straight roads meeting the spine road at right-angles. Ultimately, Sonia y Mata envisaged the connection of existing cities by series of lineal towns, the land within the triangles so formed to be used for agriculture or industry. Tony Garnier, a French architect, also worked out proposals for an industrial town of 35,000 population on lines somewhat similar to those of the Ciudad Lineal. (See Figs. 17 (i) and (ii).)

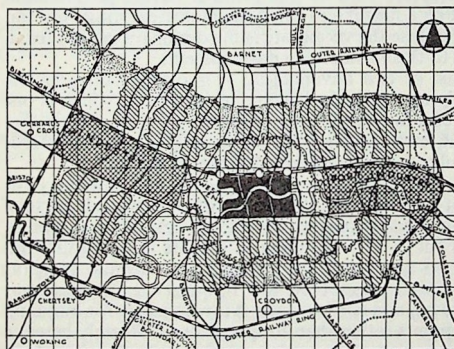
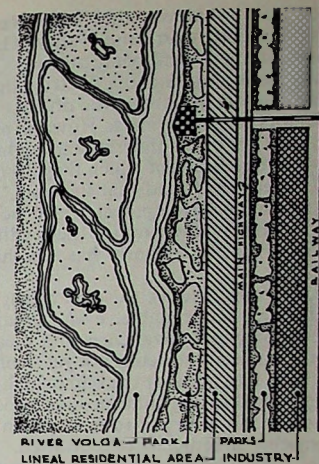
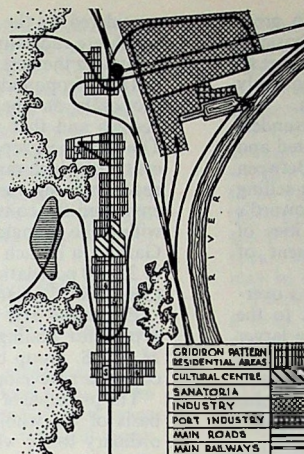
Extensions and modifications of this idea have been carried out in Russia; a plan for Stalingrad on the lineal principle has been prepared, while the M.A.R.S. group of architects worked out in some detail a scheme for the complete redevelopment of London on lineal lines. (See Figs. 17 (iii) and (iv).)

The principle of the lineal city is vertebrate; the main transport route is the basis of the whole thing, as compared with the invertebrate form of the ordinary town, which may be compared rather with that of an insect, the whole forming a stable structure with no one member having predominant importance; but it would be a mistake to carry the biological simile too far, and to infer from it that, because the vertebrate is the dominant animal form, similar advantages accrue to this form of city development.

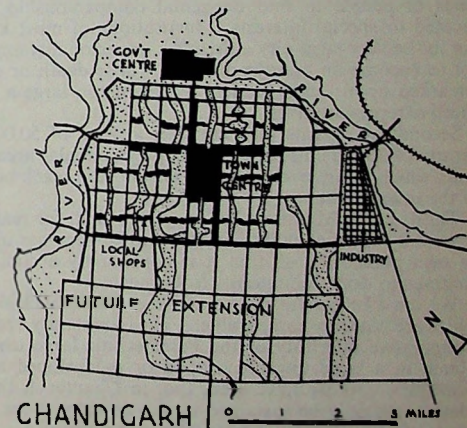
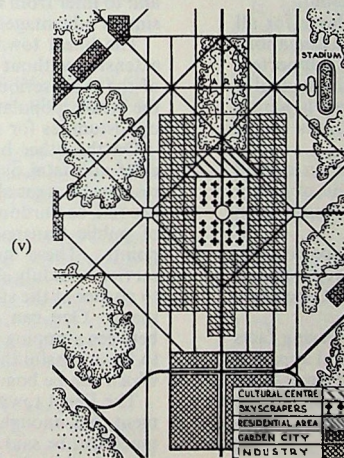
The lineal town has one or two advantages: it is capable of indefinite extension without seriously upsetting the balance of the whole, which is one of the most serious problems in enlarging the normal town; it ensures that the whole population is in close touch with the countryside and it affords opportunities for spectacular architectural and landscape effects.

On the other hand, its defects are far more apparent and serious. The chief and fatal one is that it is quite impossible to arrange that all parts of residential areas shall have equal or reasonably equal access to local centres. Second, as Purdom points out in "The Building of Satellite Towns", all forms of public transport take up and set down passengers at definite stopping points. These stopping points cannot be too frequent or the transport service is unduly slowed down, and consequently it is reasonable for buildings to cluster at the stopping points rather than to spread out uniformly between them. One can readily imagine that houses, shops and offices midway between stopping points in a lineal town would be unpopular! In fact, for it to be successful the invention of a transport system in a series of endless belts which can be boarded at any point seems necessary.

The lineal town, though not, on balance, a satisfactory form of development, has enough merit to be worth consideration. I am not sure that as much can be said for Frank Lloyd Wright's idea for a town in the form of a single building a mile high—an extreme reaction from his earlier "Broad-acres" scheme for town development at an exceptionally low density. Nor is it easy to find a great deal of practical advantage in the various ideas for



(iv)



- (i) The original Ciudad Lineal.
- (ii) Garnier's "Cité industrielle".
- (iii) Part of a lineal plan for Stalingrad.
- (iv) M.A.R.S. group Plan for a lineal London.
- (v) Le Corbusier's "City of Tomorrow".
- (vi) Chandigarh.

contemporary Planning advanced by Professor L. Hilberseimer in "The Nature of Cities". Having reasonably enough said that at the present time cities are "dominated by industry and ruled by interest," and expressed the hope that the time will come when they will be "developed according to the needs of man and ruled by reason" he puts forward ideas for fulfilling this hope which appear to be to determine the shape of communities chiefly by what is needed to avoid air pollution of residential areas by factories (easier to control the source of pollution?) and to arrange the regional pattern of communities and the grouping of units within metropolitan areas so as to reduce the incidence of aerial bombardment.

Hilberseimer's proposals include the complete redevelopment of Chicago in order to attain the latter object by means which would necessitate the imposition on the people of the United States of a code of Planning control far more rigorous than anything attempted in this country. I should not wish to belittle any imaginative Planning experiment, but this is an example of the futility of entirely ignoring the maxim that "Planning is an exercise in the practicable."

Two other striking and original methods of city development must be mentioned: Le Corbusier's "City of Tomorrow", first described in 1922, and his later "La Ville Radieuse", the former designed for three million inhabitants, the latter for one and a half million, but capable of expansion. (See Fig. 17 (v).)

The "City of Tomorrow" had elevated main roads and subways for goods traffic and trains; airfields and railway stations were co-ordinated. The central part of the town consisted of a skyscraper area, the blocks 700ft. high and a quarter of a mile apart and devoted to business and entertainment uses. Surrounding this central area was the residential area, mainly in the form of five-to-seven-storey flats, and beyond this isolated settlements which Le Corbusier termed "garden cities," but which were really detached dormitory suburbs. Industries were also concentrated in a large area apart from the rest of the town.

The "Ville Radieuse" is on similar lines to the "City of Tomorrow", but more densely developed, without detached settlements, and with the skyscrapers on the edge of the town instead of at the centre.

Tony Garnier's design for a "Cite Industrielle", makes an interesting comparison with the "City of Tomorrow".

Le Corbusier is at present indulging in the opportunity to try out some of his theories at Chandigarh, developed on a virgin site and destined to be the capital of the Punjab. Le Corbusier has applied to its design his ideas regarding the predominant desirability of the straight line in human affairs, the main road system being in the form of a regular grid. For the reasons given earlier in this Chapter, the grid iron pattern seems to have so many unavoidable disadvantages that it is extraordinary that anyone should still wish to use it.

So far as this country is concerned, although we might possibly need to create new great cities, if one among some of the possible alternative regional Planning policies discussed in Chapter 4 were adopted, this is far from being an imminent probability, and the gradual redevelopment of existing cities on

sounder lines is a problem sufficiently challenging to need most of our energy. It seems certain that it is not possible to effect a radical change in the basic form of a great city unless it has been virtually destroyed by some disaster, since this would involve an extremely rapid process of redevelopment in order to avoid complete chaos while it was going on. Even technological revolution of the most dramatic kind could hardly do more than bring such action over the horizon of possibility, and were this to happen it might well seem, nevertheless, hardly worth doing.

We must now return to rather more detailed discussion of the principles which should govern the development of new towns, since apart from the intrinsic interest and importance of the subject, the methods used may serve as a useful guide to the best ways of reshaping existing towns, providing that they do not involve forms of development so completely dissimilar from existing forms that no adaptation is possible.

Of the numerous theoretical town plans which have been produced through the ages, in varying degrees of detail, in order to illustrate their authors' ideas of the most satisfactory way of combining the elements of a town in the absence of disturbing factors, such as topography or existing development, many have assumed a form approximating to a circle. This is true of plans produced by Vitruvius, and of many ideal towns of the Renaissance. There are good reasons for this, which apply whether the dominant motif behind the design is social or military. Of all figures the circle contains the largest area of land for a given perimeter. This, of course, makes for economy in the building and manning of defences, and ensures the greatest possible compactness and degree of convenience of intercommunication between the different parts of the town. A further less obvious advantage is that the smaller the length of frontier between urban area and surrounding agricultural land the less the amount of interference to the prejudice of agriculture. The general proximity of an urban centre is advantageous to agriculture because it provides quick access to a market for produce, but, on the other hand, direct contact with it may be highly detrimental by reason of trespass and vandalism on the part of the urban inhabitants.

Fig. 18 is an example of yet another ideal town. I have prepared this in order to illustrate the effects of carrying out generally accepted contemporary ideas of Planning where there is nothing to hinder their application. No existing town will serve for this purpose, for it is somewhat startling to discover that no single one even of the British New Towns is a complete example of unobstructed Town Planning. In almost every case difficulties of topography, of existing main roads or of existing building development have dictated a pattern which is far indeed from any theoretical norm.

The only exception to this is Harlow, which was practically a virgin site, the only important existing features being a railway line and a canal; these, however, have been allowed to dominate the plan to the extent of forming the diameter of a semi-circular form of development rather than a circular one. Also, it was decided to develop in the form of a comparatively large number of small built-up areas separated by extremely large areas of open space, so that the general effect is rather of a number of villages in the countryside than

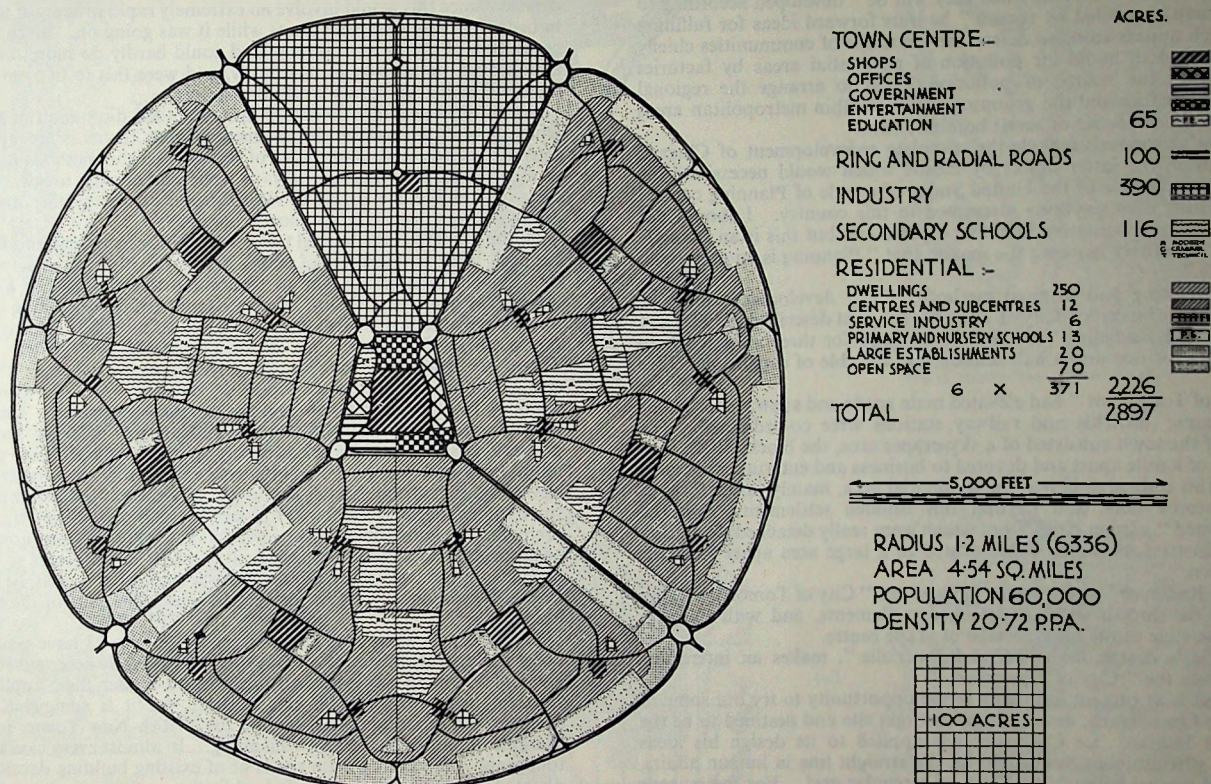


FIG. 18. The theoretical New Town from which examples are taken throughout Parts I and II of this book. This illustration is in the form of a "Town Plan".

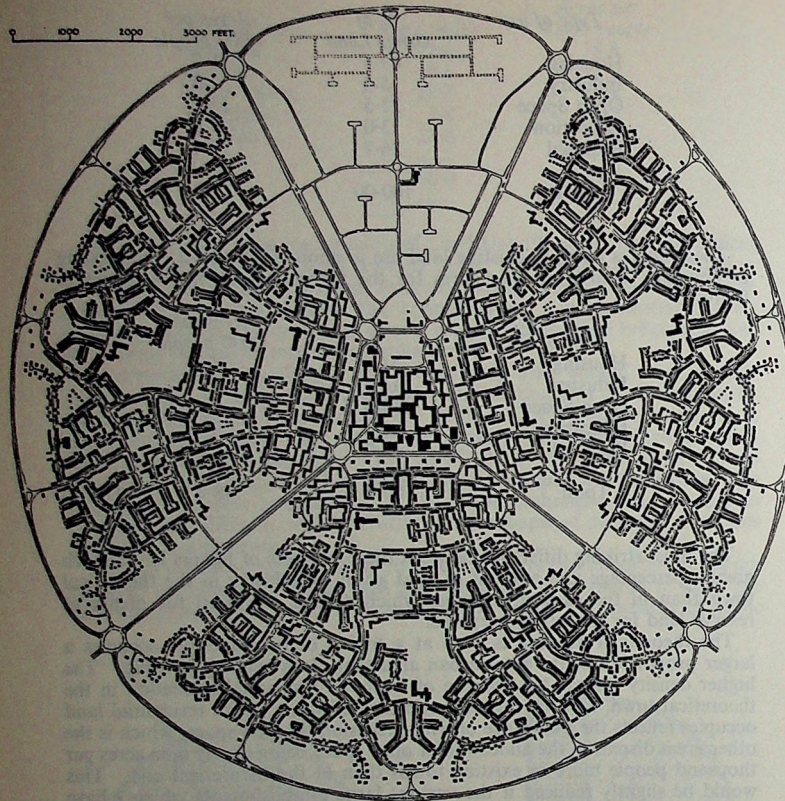


FIG. 19. The same town showing simply buildings and roads. Imaginary buildings have not been shown in the Industrial Area because of the impossibility of forecasting their number, sizes and disposition.

of a single town. (See Fig. 21). This arrangement may have considerable merit, but it seems a pity that the opportunity should have been lost of carrying out at least one complete town development on a site which made it possible to exemplify orthodox theories comprehensively.

The town shown in Fig. 18 is in essence typical of many medium-sized English towns, with the vagaries and disadvantages of unplanned growth

removed. It is assumed to occupy a completely even and featureless site.

Four main roads, assumed to bear approximately equal quantities of traffic, and with no one type of turning traffic predominating over another, enter it from the outside world. So that traffic which has no business to transact in the town shall not require to enter it, an outer ring road is provided.

It is perhaps a little difficult to believe that such a road would ever be constructed. Since there is no frontage to the radial roads and access to them is severely limited, and it is not necessary for traffic to enter the centre of the town, because of an inner ring road, it might easily be argued that no sufficient volume of traffic would be likely to use the outer ring road to justify its construction. The distance straight through the town is a little over 2.4 miles; via the outer ring road it is 3.8 miles.

It is, however, also a little difficult to imagine that so obviously convenient a road for the purposes of facilitating movement as between one residential area and another as well as for the purpose of by-passing the town completely, would not be built in connection with such a plan. Fortunately, as we shall see in Chapter 13, when considering the detailed design of one of the residential neighbourhoods which make up this plan, it makes remarkably little difference to the design of the rest of the town whether the outer ring road is constructed or not.

The road surrounding the town centre, as already stated, makes it easy for all traffic to reach destinations within the town without entering the central area, which can therefore be developed in the form of a completely or mainly pedestrian precinct, as will be explained in Chapter 11.

The bulk of the open spaces are placed adjoining radial roads and the outer ring road in order to provide a cushion against noise between these and adjoining residential development, and because in the interests of compactness it is best if the majority of open space is placed on the periphery of built-up areas, thus making accessibility of shops, schools, etc., as great as possible. It is true to say that such an arrangement may reduce to some extent the accessibility to major open space, but one cannot have it both ways, and the latter is not nearly as important as the former, an argument which will be developed in Chapter 13.

The residential areas of the town are divided into six neighbourhoods each with a population of 10,000, which is convenient for the school system. Each neighbourhood has its own primary schools, and adjoining neighbourhoods share secondary schools, which form a break between neighbourhoods, giving visual relief and a sense of identity to each neighbourhood.

Apart from very minor service industry, the entire industry of the town is massed in one area surrounded by main roads for easy access. This has great advantages from the point of view of economy in the provision of services.

From the point of view of accessibility of homes to workplaces, it might from some points of view be better to split the industrial area into two at opposite ends of the town, thus spreading the rush-hour traffic load rather than concentrating it, and probably causing comparatively little loss of economy of trunk services. There is, however, one fairly strong argument

against this alternative arrangement: if there were only one industrial worker in each family it would no doubt in the long run be possible for families to find homes in a part of the town closely adjacent to the particular factory or type of industry in which the breadwinner worked, but where, as is so common, there is more than one industrial worker in the family, it is clear that this advantage is cancelled where the workers concerned work in factories or industries located in different industrial areas. The most convenient location of the home from the point of view of one may be the least convenient for another. The town in any case has a radius of only 1.2 miles, so that nobody can be further than $2\frac{1}{2}$ miles from his work as the crow flies, and very few will be anything like as far as that. The road system should be easily capable of absorbing without difficulty all that it is likely to be called upon to bear. A second industrial area could not be provided with quite the same high degree of accessibility to main roads without the construction of an additional radial road superfluous for other purposes. Nevertheless, the advantages between one and two main industrial areas are fairly evenly balanced, and an equally satisfactory plan could probably be produced with two as with one.

No railway has been shown, because, assuming that a new line would be constructed to serve the town—and one must assume this in order to maintain the completely untrammelled nature of the exercise—two quite different solutions to the problem could be adopted, depending entirely upon considerations of cost. The cheaper method undoubtedly would be to run a railway line tangential to the town and passing close to the industrial area, with the station immediately adjoining one of the radial roads bounding the industrial area. The only disadvantage of this is that it makes the railway station comparatively inaccessible to a proportion of the town's inhabitants, although it is necessary to stress that, with unobstructed main roads, the time likely to be taken in reaching the station from even the remotest part of the town would be an inconsiderable fraction of that involved in threading one's way through the central area of an existing traditional town to the station.

Alternatively, a railway station could be provided at or near the town centre, and the line could traverse the town either alongside radial roads or between neighbourhoods. Within the central area, however, it would have to be placed either overhead, or preferably underground, in order to avoid interference with road communications. Moreover, the expense of bridges and cuttings where subsidiary roads crossed it to join the radial roads or link neighbourhoods would be very heavy.

It will be interesting to compare the allocations of land use in this theoretical town with allocations in existing towns. R. H. Best, in the *Journal of the Town Planning Institute* of June, 1958, analyses the distribution of Land Uses of various grades of settlement in England and Wales. The one of particular interest for our purposes is that dealing with "Large Settlements", which are Town Map Areas with over ten thousand population in each. Best derived average figures from a sample of 160 such areas. He divides land uses into four chief categories: Housing, Industry, Open Space and Education, and finds that the total urban area is allocated as follows:

7 - 4

| <i>Type of use</i> | <i>% of Urban Land</i> | <i>Acres per 1,000 people</i> |
|--------------------|----------------------------|-----------------------------------|
| Housing | 43.5 | 31.7 |
| Industry | 5.3 | 3.9 |
| Open Space | 21.5 | 15.7 |
| Education | 3.0 | 2.2 |
| Residual | 26.7 | 19.4 |
| Total | 100.00 | 72.9 |

These figures relate to existing land use in about 1950 and it is interesting to compare them with the figures for the theoretical town, which are as follows:

| <i>Type of use</i> | <i>%</i> | <i>Acres per 1,000 people</i> |
|--------------------|----------|-----------------------------------|
| Housing | 51.8 | 25 |
| Industry | 14.5 | 7 |
| Open Space | 14.5 | 7 |
| Education | 6.2 | 3 |
| Residual | 13.0 | 6.3 |
| Total | 100.0 | 48.4 |

The most striking difference between these two sets of figures is the much greater percentage and amount of land given to industry in the theoretical town than in the existing average, which reflects the need for plenty of reserve land for industrial purposes.

The theoretical housing is both at a higher density and yet occupies a larger proportion of the total urban area than does existing housing. The higher density reflects the absence of waste of residential allocation in the theoretical town, and the higher percentage of space which residential land occupies reflects the avoidance of over-provision of open space, which is the other great disparity, the allocation of open space being nearly nine acres per thousand people more in existing towns than in the theoretical one. This would be slightly reduced if the various large establishments which I have included in the residue of the theoretical town were added to the open space, as has probably been done with the existing towns, but it would not make any significant difference.

In short, my theoretical town, which is liable to be severely criticised in some quarters as excessively low in density, is, overall, much more sparing with land than the average of existing towns in this country.

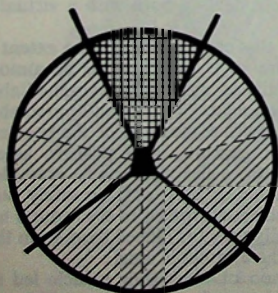
These existing towns of over 10,000 population exclude County Boroughs, and in order to get a closer comparison of the theoretical figures with existing conditions it may be as well to quote the comparable figures for County Boroughs, given by Best. The sample used is of seventy-nine out of a total of eighty-three.

| <i>Type of use</i> | <i>Percentage</i> | <i>Acres per 1,000 people</i> |
|--------------------|-------------------|-----------------------------------|
| Housing | 43.4 | 18.8 |
| Industry | 8.1 | 3.5 |
| Open Space | 18.7 | 8.1 |
| Education | 2.8 | 1.2 |
| Residue | 27.0 | 11.7 |
| | <hr/> 100.0 <hr/> | <hr/> 43.3 <hr/> |

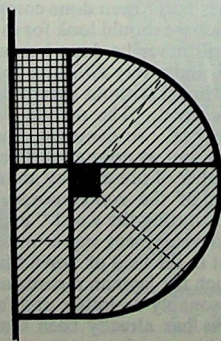
From this we see that the amounts of Land Use allocated in my theoretical town are much closer in most respects to the County Boroughs, including some of the densest development in the country, than to the smaller, more open country towns, despite the comparatively low residential density adopted, which is, oddly enough almost exactly intermediate between that of the County Boroughs and of the smaller towns.

In considering this design, one immediately asks oneself what modifications would be desirable if the origins and destinations of through traffic were distributed unevenly around the circle. This would only arise if in some directions there were no neighbouring settlements which required direct road access to the town. Fig. 20 (ii) shows the effect where there is simply one main road, which in order to avoid bridging and tunnelling, is to be kept outside the built-up area. The shape is changed from circular to more like semi-circular, which in turn alters the shapes of the neighbourhoods and other components.

Fig. 20 (iii) shows the modification involved where two important roads are required to cross each other near the town, but it is desired to keep the junction outside the town. This arrangement avoids the necessity of traffic



(i)



(ii)

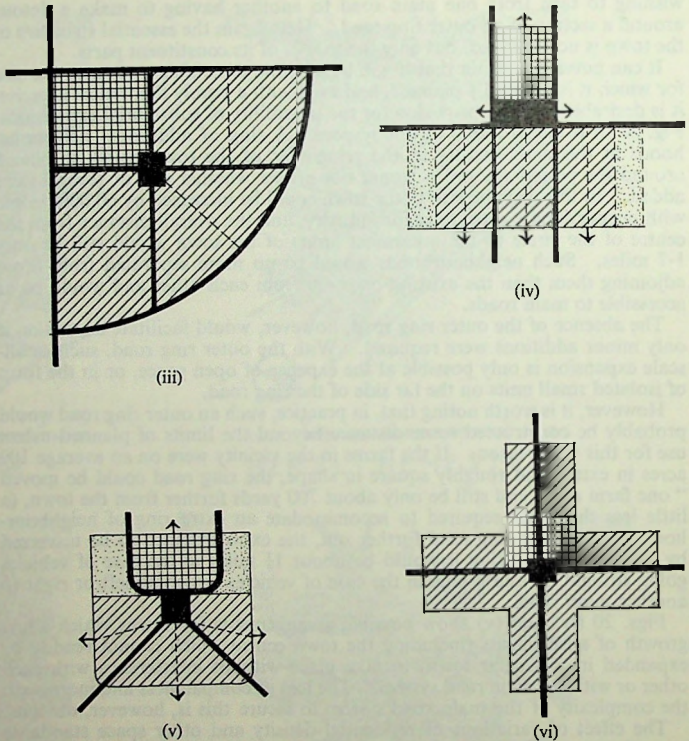


FIG. 20. TOWN FORMS. Town Centre, black. Industry, cross hatched. Residential neighbourhoods, oblique hatched. Open space, when shown, stippled.

- (i) The town shown in Figs. 18 and 19 reduced to its essentials for comparison with other forms.
- (ii) A single main through road runs past the town. Industry needs to be close to it and to the town centre, which drags the latter away from the geographical centre.
- (iii) The crossing of two main through roads is kept outside the town. Again, some displacement of the town centre results.
- (iv) Growth of all elements is untrammelled but compactness and accessibility between different parts of the town are much impaired.
- (v) Another device which allows growth for all elements except the town centre, with less sacrifice of compactness.
- (vi) A much larger town arranged to secure accessibility to the countryside for all, but the sacrifice entailed is very great; there is no reasonable accessibility between districts located in adjacent arms of the cross.

wishing to turn from one main road to another having to make a detour around a section of an outer ring road. Here again the essential structure of the town is not changed, but only the shapes of its constituent parts.

It can never be certain that it will be possible to confine a town to the size for which it is originally planned, and even with a purely theoretical exercise, it is desirable to make provision for the possibility of substantial expansions. Fig. 20 (i) is not ill-suited in this respect. A ring of additional neighbourhoods at the same density as the remainder of the town could be placed around the periphery, and it would not matter whether one or several were added. In this way the size of the town could be increased by 60,000 people with proportionate extra land for industry, and the overall distance from the centre of the circle to the outermost limits of the town would still be only 1.7 miles. Such neighbourhoods would be no more separated from those adjoining them than the existing ones are from each other and would be as accessible to main roads.

The absence of the outer ring road, however, would facilitate expansion if only minor additions were required. With the outer ring road, such small-scale expansion is only possible at the expense of open space, or in the form of isolated small units on the far side of the ring road.

However, it is worth noting that, in practice, such an outer ring road would probably be constructed some distance beyond the limits of planned urban use for this very reason. If the farms in the vicinity were on an average 100 acres in extent and roughly square in shape, the ring road could be moved "one farm out" and still be only about 700 yards further from the town, (a little less than that required to accommodate an extra ring of neighbourhoods). With the ring road further out, the extra distance to be traversed by through traffic using it would be about $1\frac{1}{4}$ miles in the case of vehicles going straight on and $\frac{5}{8}$ mile in the case of vehicles switching left or right to another main road.

Figs. 20 (iv) and (v) show possible arrangements for towns which allow growth of all elements (including the town centre which cannot readily be expanded in a circular town) to take place without interference with each other or with the main road system. The loss of compactness and increase in the complexity of the main road system to secure this is, however, obvious.

The effect of variations of residential density and other space standards upon the overall size of a town has obvious relevance here, but it can be much more conveniently dealt with in connection with discussion on space standards, and is accordingly to be found in Chapter 16.

There must be some point of size at which the considerations involved in the foregoing cease to be relevant, at which the volumes of traffic concerned require some more elaborate treatment at junctions and at which, possibly, the spatial relationship of land uses, particularly as regards the number of main industrial areas provided, changes. There seems to be no adequate information on this subject. There must obviously be a point at which it becomes necessary to provide multi-level junctions for all main roads and another point, at some larger size, where it may be necessary to duplicate main road systems, one at ground level providing for local intercommunication, the other, raised or depressed, dealing with longer-distance traffic.

We are still so far from achieving the comprehensive redevelopment of great cities that this is perhaps little more than an academic subject. Whatever the size of the city, it is necessary for main roads to pass between every other ring of neighbourhoods. At some size it becomes necessary to introduce centres of higher order than neighbourhood centres because of the inaccessibility of the city centre to outlying residential districts. It seems to be improbable that at any size range the generally circular form could be improved upon. It could be argued that in order to maintain reasonable accessibility to the open countryside for all urban dwellers, a form such as that shown in Fig. 20 (vi) would be preferable. However, in order to maintain reasonable agricultural productiveness in the areas between the arms of development, the distances between these arms would have to be very great, and the city would then have lost all compactness, and could probably have been better developed by means of a system of parent city and satellites.

Fig. 21 shows the main structure of four English new towns and two old ones which illustrate the tendencies and principles described above.

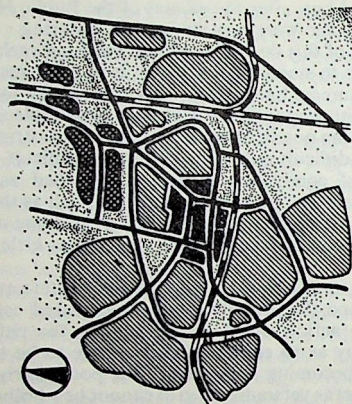
7-5. THE CURRENT SITUATION

The objectives of Town Planning (excluding the objectives of Regional Planning on the one hand and detailed Planning on the other) may be summarised as the provision of the right amount of land for each use in the right place and on sites physically suitable for each use. This includes the proper spatial relationship of homes and workplaces, of homes and schools, of homes and shopping places of various levels, and of homes with places of entertainment, both indoor and out; success of course depends at least as much upon the successful arrangement of the town's road system as upon the actual selection of land uses.

As we have seen, this is not altogether a simple matter in the case of new towns, but it is enormously more complicated to reshape an existing town so as to bring about satisfactory conditions within it. In fact, so far as I know, it has never been done completely and successfully, if judged by the standards which we should look for in the case of a new town. This does not mean that it will never be done but indicates that we are dealing both with a virtually new and a very difficult subject.

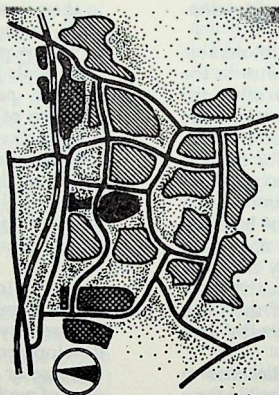
Almost without exception, every town in this country is to some extent a sick town. The defects described below are so common as to be almost universal; so common, too, as to be generally accepted, not as remediable evils, but as normal parts of an urban environment. In fact an appreciable number of present-day architects seem absurdly to regard one of the greatest evils of the contemporary town, namely congestion, as a positive asset, substituting the word "urbanity" for congestion, and referring to examples of development less crowded as "prairie Planning". It may be safely said that in the field of Town Planning, what we are accustomed to see around us, which the layman regards as normal, is usually very far indeed from even the reasonably desirable, and further still from the attainable ideal.

As has already been seen, the phenomenon of the motor vehicle led to urban sprawl, or octopus growth along main roads, to an extent hitherto undreamed of, and there are few towns indeed which do not suffer seriously,



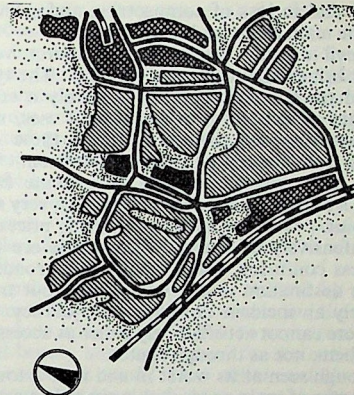
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CRAWLEY



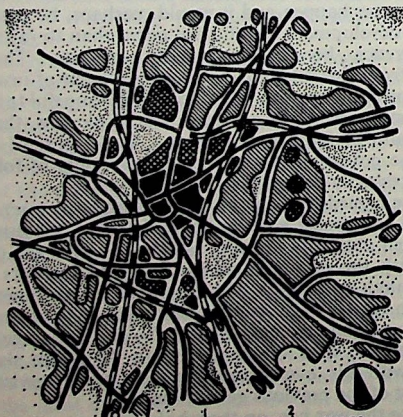
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HARLOW



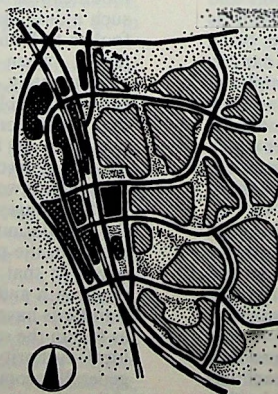
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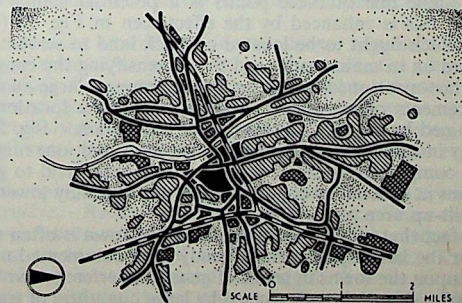
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STEVENAGE



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WORCESTER

| | |
|------------------|-------------------|
| CENTRAL AREAS | RESIDENTIAL AREAS |
| INDUSTRIAL AREAS | OPEN SPACES |

FIG. 21. The essential structure of four English New Towns and two existing towns.

both visually and in loss of compactness and safety, from ribbon development along the main roads leading to them.

Another evil directly caused by the motor vehicle is the intolerable congestion it brings about in town centres. The typical town centre in the medium-sized town in this country is simply a crossroads, very often the point of origin of the town. Central area uses, shops, offices and public buildings, have disposed themselves along these roads for comparatively short lengths from the actual point of junction. Competition for accommodation in this area has usually been acute because the geographical advantage of a central location is confined to a very small area of land around the actual point. Demand, and consequently prices, being high, the land has been very intensively developed. The roads are often narrow, and there arises hopeless confusion, for normally these roads have to carry not only traffic whose destination is the town centre, but traffic for which the town itself is merely an incident during a long journey. The roads of the town centre therefore cannot act efficiently either as access roads to the central area uses beside them, nor as through routes.

This, although seen at its worst in and near a town centre, applies also to the entire lengths of main roads within the urban area. It is impossible for a road to function efficiently as both a route for main traffic and a local service road, yet this is what the ordinary town main road has to do. It is intersected by innumerable minor roads and fronted by innumerable private properties, each with its own pedestrian and vehicular access to the road. Every single one of these points is a potential source of congestion and danger; this is enhanced by the effect seen in Fig. 54 (i) of uses such as shops which ought to be located on back land to serve housing areas being attracted on to main roads, and thus intensifying the congestion and danger.

The last-mentioned item is really one among a large number of examples of displacements of use found in towns where the location of uses has been determined by the free functioning of the market. Fig. 54 (i) also indicates the way in which all non-profit making uses, and, one might add, uses which earn a comparatively small profit per unit area, tend to get forced from the positions in which they could function most usefully towards the periphery of the built-up area.

The fact that industry in the established town is often scattered piecemeal all over the built-up area has already been commented upon. It has grave effects upon the towns in terms of general interference with the quietness and safety of residential roads caused by large quantities of traffic, and very often causes atmospheric pollution and severe visual detriment. In their own way minor industrial and commercial uses—"backyard industry"—cause similar trouble, of less seriousness in each individual case, but because they are scattered in most cases in very small units over a very large area each has an adverse effect over a number of adjoining houses, and it may often be that they exert their influence over the whole at least of the older residential parts of the town.

Worst of all, perhaps, we are at a stage where the problems of massive overcrowding in town buildings with its attendant evils. The Victorian speculative builders created deplorable physical environments for those who had to live

in the areas they developed but, after the advent of the Public Health Act of 1875, the buildings they erected were very strong and enduring. Now, in the larger towns, square miles of this development are reaching such a condition that, while it may continue to stand indefinitely, it is in other respects almost but not quite unfit for human habitation. Because of its vast bulk, the problem of replacing it with reasonable speed seems insoluble unless a very optimistic view is taken of the possibilities of the second industrial revolution.

This raises a peculiarly difficult question. However difficult it may be to plan for the fulfilment of conditions at present regarded as acceptable, including the fully effective use of important machines such as the motor car, which at present tends to dominate urban life, it is at any rate a problem of finite difficulty; but the motor car may vanish, leaving as little trace as the tram car.

The motor car was with us in a fairly highly developed state and in considerable numbers in 1914, and the probability of its increased use reasonably apparent, yet no effective action was taken to modify the pattern of new development in such a way as to enable full advantage to be taken of this increase or to prevent its becoming a menace. The possible rise to importance of methods of transport as yet undreamed of cannot be wholly discounted; to take what seems a far from remote possibility, it may be that today we stand in the same relation to the helicopter as the generation of 1900 did to the motor car.

It is apparent that universal use of the helicopter would demand drastic modification of urban layout, yet we do nothing about it. Why? Because such a development may never happen and it would, perhaps, be even more foolish to Plan for such a development if it did not occur than to fail to Plan for it when its occurrence became reasonably certain. There is, unfortunately, no escape from this dilemma : the development of inventions is unpredictable in the Neotechnic age and it would be over-hopeful to assume that prediction can become possible in a future Biotechnic age, though it would be an important aim of biotechnic society. We might, of course, employ clairvoyants in the government service but the results of following their advice would not necessarily be beneficial.

The changes in what are regarded as the minimum standards essential for the population in general are almost equally unpredictable. Compare, for example, the post-war local authority housing estates—or even the pre-war ones for that matter—with the estates built for low-paid workers in the nineteenth and early twentieth centuries. The difference is enormous, and if standards have changed so greatly in the last 50 years, may they not continue as fast in the same direction during the next 50 years? The disparager of the local authority housing estate, who sneers at it as a “modern slum” is generally comparing it with his own more spacious home environment rather than its counterpart of the previous generation.

Government policy since the war has, on the whole, rather tended to shirk the need for long-term planning. Despite an early injunction from the then Minister of Town and Country Planning to “plan boldly”, difficulty and expense have subsequently been emphasised officially, and this attitude is expressed in the Development Plan Regulations under the Town and Country

Planning Act, 1947, which require the submission of plans based upon anticipated happenings within a period of 20 years, only the most vital proposals which are likely to take longer to bring about being included.

There is very evident common sense in this policy; it helps to keep the feet of Local Planning Authorities on the ground, to make them work out what really can be done within a limited period, to prevent the Local Planning Authority which really intends to do nothing masking this intention beneath a grandiose and unrealisable plan. Further, it is of assistance in preventing public interest and optimism being aroused by the publication of long-term Plans, of which only a very small fraction can be implemented quickly, with subsequent disillusionment, cynicism, and even hostility towards Planning. Something of this kind happened in areas for which ambitious preliminary post-war plans were prepared and published.

Nevertheless, there is much to be said on the other side. True Planning must seek to look ahead as far as the complete solution of the problems with which it deals, and in many towns the redevelopment of the mass of dense nineteenth-century housing will probably hardly even have been begun in 20 years' time. Yet it is something which must happen eventually; the houses will sooner or later fall down if they are not pulled down, and no sane person would suggest their replacement at the same density. Hence, the extent and shape of any town after the redevelopment of all excessively dense housing is bound to be very different from what it will be in 20 years' time, and it seems to be absolutely essential that development plans prepared now or in the near future should take account of the eventual size and shape, otherwise it is unlikely that the comparatively short-term plan will fit in with them.

It is easy enough to list the results produced by an absence of Planning, but since, as already suggested, there is no example of a town raised to a state of complete effectiveness as the results of Planning action, it is not quite so easy to visualise the results of full and effective replanning.

Nevertheless, since the war Town Planning in this country has achieved a very great deal. The New Towns have been the objects of world-wide interest and acclaim. The legislative code included in the New Towns Act of 1946, the Town and Country Planning Act of 1947 and the National Parks and Access to the Countryside Act, 1949, constitute the most comprehensive yet flexible set of legal tools for the control of land use ever brought into being. Since the exercise of Planning powers necessarily involves limitation upon the freedom of action of individuals, and thus is bound to cause resentment and frustration in some quarters, and since many of the achievements of Planning are necessary preventive, and thus unseen, the public generally have not appreciated the achievements of Planning. This is aggravated by the fact that the most obvious end result of Planning, the appearance of buildings, poses the most difficult problems and has been dealt with least successfully. This is the more regrettable because, in terms of human welfare, the successes achieved remarkably out-weigh this comparative failure. It is therefore desirable that great and persistent efforts should be made to publicise the achievements of Planning. These include the following:—

The establishment and maintenance of Green Belts around the great

cities; the overall success of these is far greater than the detailed local failures which have sometimes occurred.

The growth of towns has been kept relatively compact by refusing permission for excessive peripheral development; in particular the pre-war menace of ribbon development has been virtually eliminated. The full effects of this limitation are not always apparent because of existing sprawl and because even outward growth has for various technical reasons not always been possible, but as the development Planned for in town maps approaches completion the beneficial results will appear.

Similarly, tremendous success has been secured in keeping the growth of villages reasonably compact. But for the exercise of firm control during the last 12 years innumerable villages would by now have lost all charm, compactness and even identity.

Very great savings in public money have been secured by reserving and keeping clear of development the routes of future roads and the sites of future important development which it is not yet feasible to carry out.

Many areas of natural beauty have been saved for the nation by refusing permission to development which would have obliterated them. In many cases the public have not yet even known that they were threatened.

Substantial success has been secured in preventing intrusive and incompatible uses being introduced into urban areas, which would otherwise have prejudiced convenience, pleasantness, the flow of traffic and safety.

Density control has been generally effective in preventing the exploitation of land by over-intensive use, with all the social and economic disadvantages which this entails.

In innumerable cases, the amenities of local residents have been protected from the intrusion of minor uses incompatible with residential areas.

Most important of all, the overall control of land use has achieved much in conserving the country's natural resources, in particular by preventing the loss of valuable agricultural land to urban development and in preventing the loss of valuable mineral resources through development above them rendering them inaccessible.

The process of reshaping existing towns to bring them into better condition is slow and unobtrusive. Redevelopment undertaken by private enterprise has to wait upon such events as the falling in of leases and the emergence of an entrepreneur wishing to invest capital in a particular scheme. This may account for the tendency in some quarters to suggest that the art of Town Planning is dormant or withered in this country. The truth is far otherwise. Spectacular schemes such as New Towns or large town extensions carried out over a short period are necessarily few in number. Quantitatively, the reshaping of existing towns is a much more important process, and though it is hampered by legislative, financial and administrative impediments, there is little ground for thinking that the majority of town Planning officers are not capable of dealing with their task.

7-6. THE PLANNING BALANCE SHEET

Mention was made at the end of Chapter 2 of the concept of the "Planning Balance Sheet". For a full explanation of this very important idea the

reader is referred to Dr. Lichfield's book, particularly Chapters 18 and 19. The essence of the idea, as applied to Town Planning, is that the Plan can usually take one of a considerable number of forms. It is seldom that only one solution is possible for a given problem, and the Town Plan may be regarded as the solution not of one, but of many problems, each of which is capable of being solved in several ways. The relative advantages and disadvantages of the different possibilities are by no means always so evident, and the Planning Balance Sheet provides a method of choosing between them, which, though it may not be infallible and though it certainly cannot exhaust the factors which need to be taken into account, can, at least, bring a large proportion of them within the scope of accurate comparison by measuring the private and public benefits and costs accruing from each.

As Lichfield is careful to point out, an increase in public benefit may also entail an increase in private costs, though this is by no means necessarily so, and it is necessary for Planning decisions to be taken with full cognisance of the effects which they will have on private costs. As has already been explained, good Planning must necessarily result in greater efficiency and a reduction of private and social costs overall, but some of the methods used to attain reduction in social costs may increase private costs, not overall, but in relation to particular groups or interests.

Lichfield summarises the policy which should be followed, in these words: "In short, therefore, Land Planning aims at a reduction in costs both private and social, and at an apportionment between private and social costs which is in accord with social conscience." Later, he enlarges somewhat on this: "In avoiding prospective liabilities that can be avoided by the exercise of foresight, planning can be said to pay always, for 'a city must pay for planning or lack of planning.' But since the liability that is avoided would sometimes fall on the individual, and sometimes on a local authority or the National Income, it is relevant to ask 'Whom does it pay?'"

The main reason underlying this possible conflict is that the approach of private developers is inevitably somewhat different from that of the Planning authority, which must be concerned with wider effects than those which the private developer considers to be his concern. As the Planning machine is at present constituted this is not the end of the matter, for even Local Planning Authorities may not necessarily take as wide a view of the economic consequences of their decisions as is desirable. The arrangements of local authority finance may well mean that a Planning decision which would be the most truly economical in terms of national finances, would be less economical in terms of Local Planning Authority finances. And, again, a form of development which would be most economical from the point of view of a County Council might not be the most economical for a Borough or District Council.

It may reasonably be said that it is anomalous for this to occur, and that a well-devised machinery for local government would avoid such anomalies, but they spread beyond the limits of local government. As we shall see later on in considering the economics of different kinds of housing, the artificial devices of subsidies may have a profound effect on local housing policy quite independently of and having results which sharply conflict with real economy.

Lichfield does not venture to adumbrate a methodology for the preparation of Planning Balance Sheets, indeed he says: "While the Planning office is responsible for marshalling the relevant items in the Planning balance sheet, it must rely to a great extent, for the measurement in money terms of the items themselves, upon developers and interests affected by the proposals and other expert sources. It should not be necessary . . . to prepare estimates . . . of the costs of building dwellings at different densities, of constructing different lengths of roads, of the productivity of different pieces of agricultural land, of the economics of alternative schemes for providing gas, electricity or bus transport, of the economics of building offices and shops. In the Planning office there are necessary, however, the skills which are required to use such estimates, and to weigh them up."

Lichfield gives interesting examples of the ways in which the economic advantages and disadvantages can be worked out in relation to specific items. He pays special attention to the loss to the community of agricultural land and its potential produce, and illustrates the use of the "food replacement yardstick" suggested by Dr. G. P. Wibberley, which is intended to assist in arriving at a decision as to whether to use good quality farm land for housing, cheap to develop because of its physical characteristics, or poor quality farm land producing less food, but more costly to develop because of its physical character. The yardstick is whether the loss of food resulting from the use of the better land will be more or less than what could be made up by investing the difference in development costs in the improvement of other agricultural land elsewhere, or in the reclamation of unused land. If the loss is greater then the poorer land should be developed, if less then the better land should be developed and some other land improved agriculturally by spending on it the development costs saved. It is worth pointing out that at present we do not, of course, have any machinery for securing that such money is, in fact, invested in the improvement of other land but this does not invalidate the principle.

The selection of one site rather than another for development should, however, be influenced by many other factors, some of them capable of expression in monetary terms—others not. In discussing the factors involved in deciding between four different schemes of development for the extension of a town Lichfield has the following to say, which makes clear the great range of the subject. "The financial appraisal, not only for the dwellings . . . but also for ancillary development, would tell the authority which scheme would be cheapest in capital and annual cost. . . . In making its decision the authority would also be influenced by the other expenditure that the scheme would cause to fall on the rates. For example, less expenditure by the authority in providing schools, open spaces, community buildings, libraries, etc., would be probably required with the greater concentration because more people could make use of the facilities which existed in the centre, and also less expenditure would be required to run the municipal services of the authorities, the policing, refuse collection, street cleansing, gully emptying. With the greater spread there would be greater cost on new and improved principal traffic roads and also higher costs in maintaining, cleansing and lighting the new roads. It might be, however, that the new

mileage justified the use of vehicles and plant which were not previously economical in use, so reducing the average costs of maintenance, etc., throughout the town.

"The authority might or might not take into account also the following implications. The more the town spread the more capital expenditure would be required of the Gas and the Electricity Boards. But even in the most expensive scheme it would not follow that the cost per unit of producing the extra gas or electricity would be more than the cost per unit before expansion, and that all current consumers in the locality would thereby need to face an increase in charges. It might be that because of the way in which the existing mains were distributed, or because the existing works had latent capacity, the additional consumption would enable the undertaking to reduce its cost per unit for any of the schemes. This could be calculated.

"The bus services on the road would probably cost more per head of the population with the greater spread; but here again the results could only be judged in relation to the economics of the existing services. The additional dwellings in any scheme might, for example, be located where newcomers used the section of the service previously running at a loss. In the high density scheme the occupiers of dwellings on the inner sites, including families with children would have the disadvantage of living in flats on a congested site. In the lower density scheme more of these people would be

living on the outskirts where they could if they wished, have family dwellings; and the remainder would have pleasanter living conditions in the inner areas because of the lower density.

The lower density schemes would spoil the amenities of more open country than would the high density scheme with the greater spread of the town into the country. They would also sterilise more agricultural land but would give rise to more production from houses, gardens and allotments. This could be measured financially."

7-7. CONCLUSION

This Chapter has dealt in outline with the shape, size and anatomy of the town as a whole. The two following Chapters deal with the technical processes of preparing Plans to remedy and improve the condition of towns. This, strictly speaking, is the scope of Town Planning as such; all the Planning work described in the various chapters of Part II which deal with the different parts of towns has to be undertaken in the light of the Plan decided upon for the town *as a whole*. It is very important to bear this distinction in mind, for, in ordinary conversation, and even in learned discourses, the different levels of Planning are commonly confused. *Town Planning* ought to mean Planning *towns*, not Planning bits of towns.

CHAPTER 8

LOCAL SURVEY

8-1. INTRODUCTORY

Local survey includes a study in greater detail of many of the subjects dealt with under Regional Survey, with the individual town or village as the survey unit, but, whereas the Regional Survey is confined almost entirely to an investigation of the facts needed to ensure the satisfactory location and distribution of new development, a large part of the Local Survey is concerned with the analysis of the present distribution, density and condition of existing development with a view to deciding what changes should be made when redevelopment takes place and the amount of extra land which will be required to reduce the density of building to a satisfactory level if the existing overall density is excessive or what land can be saved if it is lower than necessary. In relation to statutory planning, the Local Survey is that upon which the town map is based, just as the county or joint board map is based upon the Regional Survey.

The Local Survey may deal with a town, a village, an area of sporadic development or a new town site. It is important that the survey area should cover not only existing development but all surrounding land which might possibly be required for its future development. A generous margin should be allowed; it is much better to cover rather more land than is required than to omit the smallest portion needed. Apart from the loss of time involved in making a supplementary survey it will be desirable to have special 6in. to one mile base maps prepared for each local area, and if these do not, in fact, cover all the land which proves to be needed they will be useless.

8-2. LAND USE SURVEY

(i) Scope

This survey needs to be prepared in the first instance at a scale of 1/2,500 and should cover every part of the region in which non-agricultural buildings and uses exist ("agricultural buildings" being taken to mean buildings other than dwellings). Development control problems may arise anywhere; they are not confined to town map areas, and a thoroughly accurate and detailed picture of existing land use is necessary to deal with them. The survey of existing land use is of fundamental importance; all proposals are based upon it, and great care should be taken to ensure its completeness and accuracy. The portions of the survey covered by town map areas can, for convenience, be extracted and shown on the 6in. to one mile base maps for these areas.

(ii) Survey methods in the field

Much of this section also applies to surveys made in the field in connection with the subjects other than land use, but because of the paramount import-

ance of this survey, its relatively complicated nature, and the fact that it is needed for densely built-up areas as well as rural areas, an account of the appropriate procedure is included here.

Experience suggests that most Planning surveys can best be carried out by people working in pairs, one to record information on the map, the other unencumbered and free to prowl round and tell the first what he discovers; particularly is this the case in land use survey. Some writers have urged the desirability of collecting survey information on all subjects during one visit. While there is much to be said for this point of view, I do not myself believe that it is normally the best procedure; much of the information to be obtained from inspection needs the exercise of judgment if it is to be recorded correctly, and it is difficult to consider a number of diverse subjects on a single occasion. There is, too, a certain rhythm about such work; a land use survey sometimes proceeds at considerable speed, and the sudden intrusion of difficult problems relating to other subjects would be calculated to reduce this seriously. Further, particularly in unfavourable climatic conditions, it is extremely difficult to record a large volume of information on a map in the field sufficiently clearly for it to be able to be plotted afterwards with certainty.

On balance, therefore, I believe that, just as "one subject one map" is a sound rule for presentation, "one subject one visit" is a sound rule for survey, and that what is lost in expenditure of footwear and petrol is likely to be more than repaid in the results achieved.

This is not, of course, a rule to be followed slavishly; the small extent of a particular survey area, its remoteness, or even the personal preference of the surveyor, may suggest some other procedure in a particular case. In a very large town with a severe redevelopment problem, for example, where a small army of surveyors has to be employed, it may be best not to mark any information at all upon maps but to have a card or paper form for each building and to record upon it at one visit all the survey information needed, the necessary maps being prepared afterwards from the information given on the forms. Examples of the forms used for this method are to be found in the Ministry of Town and Country Planning's Handbook on the Redevelopment of Central Areas. It is, however, improbable that this would prove the best method in any except the most densely built-up portions of large towns since, although it is capable of yielding a great deal of precise information, it is inflexible and does not lend itself to short cuts.

There is little doubt that, in residential areas and areas of scattered development it is best to use a car; the surveyor in the passenger seat carries the map, marks it and observes the land on his side, while the driver observes on the other side and supplies the passenger with information at intervals, such as "All houses this side: solidly built up." Whenever anything requiring detailed scrutiny appears, the car must, of course be stopped. As density and diversity of use increase it will become necessary to stop more and more frequently and to make sallies from the car for purposes of detailed investigation, until eventually the stage is reached at which the pattern of development becomes so complicated (and often traffic so congested) that the car ceases to be useful, and the work continues on foot.

It is possible in this way for a pair of fairly experienced surveyors working

well together to carry out an accurate and detailed use survey of a town of normal structure with a population of 35,000 in ten to twelve working days of moderate length. The great advantage of using a car is that in every town there are large areas containing practically nothing but dwelling-houses, and the survey can be done perfectly well by driving through them at about 15 miles an hour, a vast saving compared with the time which would be taken in walking.

It is important to be properly equipped for the work; most people find that it is best to cut the old style 1/2,500 ordnance sheets into four quarters and to fasten them to map boards. The new style sheets are of convenient size, undivided. Information is plotted on the map quite roughly in coloured pencil, using colours and notations approximating to a simplified version of those to be used on the final map. Written notes and inset sketches should be used fairly freely to clarify complicated points which might later cause difficulty. Great care should be taken to make these legible. It is surprising how quickly memory can fade and fail to recall the meaning of an illegibly written note.

In many areas the most recently published 1/2,500 ordnance sheets are badly out of date, and the approximate revisions which will often have been carried out and plotted by local authorities should be used whenever they are available. Where such revision has not been done much work can often be saved by the turning up plans of recent development deposited with the local authority for Planning permission or by-law consent purposes and plotting these on the maps. Often, however, development has not been carried out in accordance with the plans submitted, and they should be checked against aerial photographs before being plotted. Plotting from ordinary small-scale aerial photographs is not a rewarding procedure, as the difference in scale is too great.

All too often, however, the difficulty of gaining access to information which should be readily available drives the surveyor to direct site survey; also, there may often be a small amount of development of which no documentary record is available; in particular, areas of shack development which have never received any kind of sanction. These will have to be plotted by direct survey. Although, for most Planning purposes it is sufficient to plot such development quite roughly, it is usually worth while to fix it accurately since this may later save a great deal of trouble in identifying the sites of applications for permission for "infilling" development. This will have to be done with tape and chain, distances to plot boundaries, etc., being measured from existing features clearly identifiable both on map and ground. The boundaries of land owned by public authorities, where complicated or inaccessible, can best be obtained direct from the owners; much time may be wasted in plotting them on the ground.

It is extremely important that every map used for Planning purposes should be right up to date. The map is the planner's principal tool, and any defects in it are bound to be reflected sooner or later in his work. Accordingly, all development added to the 1/2,500 maps in the course of carrying out a use survey should be transferred in the appropriate degree of detail to the 6in. to one mile, 1/2,500 and 1in. to one mile maps. This is an ideal

seldom realised but is of great importance, for it is not practicable constantly to refer back to the 1/2,500 map to check the accuracy of others.

(iii) Subject-matter

A complete use survey should denote the use of every building and every parcel of land within the survey area, but in order to make the map easily comprehensible it is convenient for closely similar uses to be grouped together under a single notation, and for others less similar, but still related, to be shown with only minor differences of notation. The following suggested notation, which is not complete in every particular, closely resembles that contained in Circular 63 of the Ministry of Town and Country Planning but with some alterations, thought to be improvements, which will be considered later when the Ministry notations are discussed. Colouring should cover the entire site in every case, not merely the buildings on it.

Any item not referred to here but included in the Circular 63 notation is intended to be coloured in accordance therewith.

GROUP I—RESIDENTIAL

Single family dwelling-houses

Red-brown (1.3)

Residential buildings, such as holiday hotels and flats, whether built originally as flats or converted from single family dwelling-houses

Red-brown (1.1)

GROUP II—BUSINESS

Shops, including banks, public houses, and post offices

*Blue (1) Banks marked "B"
Post Offices marked
"P.O.", Public - houses
marked "Pub," all in
black.*

Petrol-filling stations and repair garages

*Blue (1) and marked GAR
in black.*

Commercial hotels

*Blue (1) and marked HOT.
Edging and fine horizontal
Hatching in Blue (1).*

Offices

*Edging and fine vertical
hatching in Blue 1) with
the particular use shown
in black.*

Miscellaneous business uses, such as builders' yards, bus garages, telephone exchanges, etc., not covered by other business categories

Warehouses (if not ancillary to a shop or other business)

*Edging and fine cross-
hatching in Blue (1)*

GROUP III—PUBLIC BUILDINGS

Places of Assembly, Public buildings and institutions, including hospitals, clinics, churches, government and local government buildings frequently visited by members of the public, cinemas, swimming-baths, stadia and sports grounds normally making provision for large number of spectators, railway and bus stations, docks and harbour buildings used by passengers

*Red (2) with the particular
use shown in black.*

Schools, colleges, etc.

Yellow (1)

GROUP IV—INDUSTRY

Land used for general industrial purposes, including electricity power stations, gas works and waterworks
Land used for special industry

Land used for surface mineral working

Red-purple (1)

Red-purple (1) with black edging and horizontal hatching.

Edging in Red-purple (1) note of mineral being worked, depth of working, etc., in black.

GROUP V—MISCELLANEOUS URBAN USES OF LAND WITH FEW OR NO BUILDINGS

Street markets }
Auction grounds }
Car parks }
Unused land
Railway lines, sidings, engine sheds, etc.

Area used bounded by broken Blue (1) line and use indicated in black.

Uncoloured

Grey (1.2)

GROUP VI—NON-AGRICULTURAL USES OF OPEN LAND

Open spaces normally open to the public in general without payment

Yellow-green (1)

Private open spaces:—

Golf courses

Private sports clubs' grounds }

Green (1.2)

Grounds of hospitals, institutions and other uses other than schools mentioned in Group III, where the buildings occupy not more than about one-twentieth of the total area

Edged in Red 2, buildings themselves Red 2, remainder Green (1.2) with the particular use marked in black.

Grounds of residential buildings where the buildings occupy not more than about one-twentieth of the total area

Buildings and immediate curtilage Red-brown (1.1), remainder Green (1.2).

Gardens of houses where the gardens are larger than two acres

House and immediate curtilage Red-brown (1.3), remainder Green (1.2)

Allotments

Green-brown (1) Statutory allotments marked "S" in black.

Brown (2)

Cemeteries and crematoria

Yellow Brown (2) marked "SD" in black.

Sewage disposal works

Yellow Brown (2). Note in black as to nature of waste and height of deposit Red (2) broken edging. Note in black of use where security permits.

Land used for disposal of refuse

Areas used by Service Departments for operational or training purposes

Edged in Blue (1), buildings in Red 2, remainder in Green (1.2).

Edging in Red-brown (1.1). Blue (2.2).

Civil airfields

Holiday camps, whether or not permanent buildings exist
Land covered by water, including reservoirs

GROUP VII—AGRICULTURAL USES—(if required)

| | |
|---|---|
| <i>Pasture</i> | <i>Green-brown (1.2)</i> |
| <i>Arable</i> | <i>Brown (2.3).</i> |
| <i>Hops</i> | <i>Brown (2.3) fine cross-hatched Green (1)</i> |
| <i>Woodland</i> | <i>Green (1). Forestry Commission woodlands indicated by black lettering.</i> |
| <i>Orchards, market gardens and fruit plantations</i> | <i>Yellow-green (1.2)</i> |
| <i>Rough grazing</i> | <i>Yellow (1.2).</i> |
| <i>Land entirely unused</i> | <i>Uncoloured.</i> |

It may often be difficult to decide whether a particular building should be classed as a dwelling-house or as a residential building. Houses are quite often split up into flats in the most informal fashion without any real adaptation. A house should be shown as such unless there is clear evidence that it has been converted into flats; the presence of more than one bell on the front door is a definite and readily visible proof of this. Merely suspicious circumstances such as heterogeneous window curtains, or several prams in the front garden should not be accepted. It does not very much matter whether every home in multiple use is so recorded; what is of importance is that the survey should reveal the areas, usually fairly definitely bounded, in which numerous such conversions are taking place.

It will often be found, particularly among buildings in business areas, that several uses occupy a single building—e.g., shops on the ground floor with offices and flats above. Nearly always the ground floor use is the predominant one; the map should be coloured in accordance with this, and the existence of the other uses can be shown by notes written on the maps, such as "2F" to denote two floors used as flats, or "1O" to denote one floor used as offices.

Occasionally, there will be a case where the ground floor use is clearly not the predominant use—e.g., a ten-storey block of flats with the ground floor used as shops; this creates an awkward problem, and the method just described, although it would give all the information needed, would be visually misleading. Probably the best method although not altogether satisfactory, is to indicate the predominant use by the appropriate colour and to indicate the ground floor use by means of a note.

Mention has already been made of the need to present the use survey at various scales and for the notation to be consistent throughout. No great difficulty is likely to arise in transferring from one scale to another, the principle being to attempt only the degree of detail which can be shown with clarity at any particular scale. For example, on the 6 in. to one mile scale, occasional isolated shops within residential areas would not be shown and no distinction would be made between houses and flats. Much the same would apply to the 1/25,000 scale, the division between what would be shown and what would not being adjusted slightly. At the 1 in. to one mile all finer detail would necessarily disappear, and nothing but the fundamental use structure of the area would appear.

There is one difficulty, which is likely to arise fairly frequently. Many towns contain areas of mixed uses, in which residential predominates, but

shops, pubs., and industrial buildings are so numerous, though the sites are small and scattered, that the area has a special character—usually unpleasant—and it would be quite misleading to show it as residential. In such circumstances it is desirable to show the non-residential uses on the smaller scales, even though each site, individually, would otherwise be considered too small to differentiate. If the mixture of uses is so intimate that this cannot be done it may be necessary to introduce a new notation, probably in the form of hatching, to denote “mixed uses.”

8-3. DENSITY SURVEYS

Density, in relation to Planning, means much the same as it does in ordinary language, the number of objects—houses, rooms, persons, etc.—per unit of space. Detailed information about density is of vital importance for Planning purposes, for upon it are based most of the proposals for reducing congestion.

The subject is a difficult one and, as will be seen, no completely adequate technique has yet emerged.

The study of density may be divided into residential and non-residential.

Residential Density. Residential density has at times been expressed in terms of houses per acre, habitable rooms per acre and persons per acre. The land included in the density calculation may be the whole area of the town, in which case the resulting density is usually called “overall density”, the whole of the land in a predominantly residential area, known as “gross neighbourhood density”, or the land included in house plots, residential roads and incidental open spaces only, known as “net residential density”. The sub-areas for this last category may be broken down to very small dimensions to give results in as great detail as may be required; normally, however, the unit used is each continuous area of houses of generally similar type.

Of these, houses per acre, which was generally used for density calculation before the war, have been seen to be far too variable in size to be satisfactory, since houses may vary between the three-room cottage and the thirty-room mansion. Flats, too, are difficult to account for, since, if the flat is taken as the unit, a building identical with neighbouring ones, which may, in fact, house no more than the average number of people living in a single house, will have to be counted as two or more units instead of one, merely because it has been converted into flats. This would be shown in the density map as an intensification of land use which would be misleading.

The method of calculating density set out in Circulars 40 and 63 of the Ministry of Town and Country Planning abandons the house as the unit and provides for separate surveys of the number of habitable rooms per acre, or *accommodation density*, and of the number of persons per acre, or *population density*, each survey being made in respect of the same sub-area, so that the two can be directly compared, and the “*occupancy rate*,” or number of persons per habitable room, found in order to reveal areas of under-utilisation on the one hand or overcrowding on the other.

There is little doubt that this is a generally sound method; its only drawback is that it fails to take account of the sizes of rooms, which may materially

affect the number of persons who can live comfortably in a house. A possible alternative would be to calculate accommodation in terms of habitable floor space per acre and to measure the occupancy rate in terms of persons per 1,000 square feet of floor space. This, however, would leave out of account the fact that a comparatively large number of small rooms may be conveniently occupied by more people than a smaller number of large rooms with the same total area, an omission at least as serious as the other. In any case this alternative method would be very much more laborious to carry out than the first, with which, on the whole, the weight of advantage seems to lie.

Carrying out the Accommodation Density Survey. The first step is to obtain 1/2,500 sheets of the whole of the built-up part of the survey area. Street numbers should be marked on them. All predominantly non-residential areas should be blocked out, since no realistic figure can be obtained for the residential density of, for example, the residential accommodation in a shopping area, which, if quantitatively great enough to be relevant can best be separately noted as a total figure rather than as density.

The predominantly residential portions should then be divided up into areas of similar type. This can usually be tentatively done from the map with the assistance of some local knowledge plus, perhaps, an inspection of doubtful areas. The areas should be similar, both as regards the type of house and the size of garden, though even quite substantial variations in the sizes of gardens due to accidental circumstances such as the incorporation of an irregular property boundary into the lay-out as a back fence line can be ignored provided the general character of the area is homogeneous.

Occasionally one may be misled by the presence of blocks of three-storey houses of similar ground area to adjoining two-storey houses, but this is soon detected and corrected. The object of this preliminary sub-division is, in fact, quite tentative, and merely provides a starting point; without it it is easy to become confused.

It is important that the sub-division should take account of type of house as well as of apparent density, because, as already explained, the same sub-divisions have to be used for the population density survey, and the occupancy rate may vary markedly between houses with similar sized gardens; e.g., an inter-war speculative estate where the number of children may be well below the average, and a post-war local authority estate in which size of family is an important qualification for tenancy.

The land included within each sub-division should be chosen in order to calculate net residential density; i.e., it should include the house plots themselves, the roads giving access to them, and any purely incidental open spaces such as small roadside greens. It is not always easy to decide where to draw the line as regards the last item. Small open spaces in the centre of house blocks used by the inhabitants in common should clearly be included, but, on the other hand, larger areas of allotments are also to be found, which should not be included. Each case must be judged on its merits and the best test is to consider whether a particular open space is in the nature of an extension of the gardens of a few houses which is used in common, or, on the other hand, is used or likely to be used by the inhabitants of a wider area, in which case it

approaches the character of an ordinary local open space and should not be included.

The next step is to find the number of habitable rooms in each area and its acreage; the latter divided into the former gives the net accommodation density in habitable rooms per acre. Ministry of Town and Country Planning Circular No. 63 recommends that all habitable rooms in excess of six in a house in occupation by a single family should be ignored. The object of this is to take account of the fact that in many large houses there are rooms which are hardly used at all, and their omission gives a picture which is in some ways more informative. On the other hand, such houses may at any time be converted into flats, and although the extra habitable rooms cannot be fully used until extra kitchens, bathrooms and W.C.s have been created, it is advisable to have a record of them. On balance, my own opinion is that these extra rooms should be included in the survey.

Some difficulty may arise in deciding what can and what cannot be reasonably regarded as a habitable room. Living rooms and bedrooms are, of course, the habitable rooms proper, but it is sometimes reasonable to include a kitchen. If, for example, there is a separate scullery, and particularly if there is also a wash-house, the kitchen is likely to be used for all the purposes of a living room as well as for cooking, and to be perfectly suitable for these purposes. But if the room has to be used for drying clothes, or, still more, for washing up, though it may still perforce be used as a living room its suitability for the purpose is much less, and it should not be treated as such in the survey. In other words, reasonable suitability is a better criterion than actual use for assessing future needs.

Similarly there may often be a doubt whether "box-rooms" used as bedrooms are suitable, which can only be resolved by making a more or less arbitrary decision and following it consistently.

A problem arises regarding the treatment of hotels, nursing homes and institutions. Where these occupy extensive grounds it means nothing, particularly in the case of hotels, to express density per acre in terms of the number of habitable rooms—some of which, such as lounges, may not be rooms in the ordinary sense at all—divided by the area of the grounds. Such buildings should be entirely excluded from the survey. On the other hand, small private hotels, nursing homes, etc., among ordinary residential property should be treated in the same way as their neighbours.

Various methods can be used for obtaining totals of habitable rooms; minute accuracy is not essential, and a house-to-house inquiry is unnecessary. It is frequently possible to obtain information from rating officers and building inspectors and other local authority officers, whose intimate knowledge of the locality, supplemented by reference to record books in doubtful cases, normally proves quite adequate. In the rare cases where this is not so a representative sample survey undertaken by making personal inquiry at several houses of each type, the number of inquiries being proportionate to the total number of houses of that type, will give the information needed. If it is decided to do this, information should be obtained at the same time regarding the number of persons normally resident in each house visited for the purpose of the population density survey (see below). However, even a

sample survey may well take more days to carry out than it takes hours to obtain information at least as accurate from local officials, so that it should not be undertaken unless this source fails or the survey is going to be undertaken in any case for population density purposes.

Carrying out the Population Density Survey. The demarcation of sub-areas and determination of their acreages will already have been carried out in connection with the accommodation density survey. All that has to be done is to determine the number of people who live in each block. This is by no means easy to do, except by means of direct sample surveys. The electoral registers give the adults living at each house and are conveniently arranged street by street but provide no clue as to the distribution of persons below the age of 21. Multiplying the total number of voters in an area by a factor

$\frac{\text{total population of town}}{\text{total number of voters in town}}$ will make the grand total right but will mask any variation in the distribution of juvenile population. It may be possible to obtain the distribution of children of school age from school registers, but this leaves out of account all children below school age, all at private schools and all who have left school but not yet reached the age of 21.

Usually a sample survey will be the quickest method of obtaining reasonably accurate information, but even this is likely to prove a formidable task. For example, a town of 60,000 persons would contain perhaps 18,000 households, and it would probably be necessary to visit at least 10 per cent. of these, or 1,800. Allowing for time spent in movement, for a proportion of refusals to answer and for houses with no one at home, it is unlikely that more than 5 visits per hour could be made by each investigator, so that the field work alone would take about 350 man hours. This may not sound a great deal, but, repeated for each town in a county, it represents a serious expenditure of the limited survey labour available.

The information obtained from a population density survey, though immediately valuable, is unlikely to remain accurate for very long, for occupancy rates can change significantly in quite a short time. In towns where it is known that overcrowding is not a problem of serious proportions it may therefore be defensible to use figures based on the electoral rolls, and to accept the inaccuracy known to be entailed.

A simple division of the estimated total population of each area divided by its acreage gives population density in persons per acre.

Occupancy rates. $\frac{\text{Population density}}{\text{Accommodation density}}$ gives the occupancy rate in persons per habitable room; this information can be used in the calculation of areas required for the reception of overspill resulting from the reduction of occupancy rates in order to relieve overcrowding, as will be explained in Chapter 9.

Presentation of Residential Density Surveys. The whole of the information obtained from the three surveys just described should be tabulated to facilitate detailed calculations, but a map should also be prepared for each to emphasise visually its most important lessons. For accommodation and

population densities similar broad ranges of density should be differentiated, colours or hatchings becoming stronger as the density increases.

The ranges selected will naturally vary with the type of town concerned, but might typically be as follows:

| | | | | | |
|---------|-----------------------------------|---|---|---|---|
| Up to | 20 rooms or persons per acre. | | | | |
| | 21- 40 rooms or persons per acre. | | | | |
| 41- 60 | „ | „ | „ | „ | „ |
| 61- 80 | „ | „ | „ | „ | „ |
| 81-100 | „ | „ | „ | „ | „ |
| 101-120 | „ | „ | „ | „ | „ |
| 121-140 | „ | „ | „ | „ | „ |
| 141-160 | „ | „ | „ | „ | „ |

Occupancy rates should also be grouped, and suitable ranges might be:

| | | | | | |
|---|---|---|---|---|---|
| Less than 0.5 persons per habitable room. | | | | | |
| 0.5 -0.75 | „ | „ | „ | „ | „ |
| 0.76-1.00 | „ | „ | „ | „ | „ |
| 1.01-1.25 | „ | „ | „ | „ | „ |
| 1.26-1.50 | „ | „ | „ | „ | „ |
| Over 1.50 | „ | „ | „ | „ | „ |

(See Figs. 25 and 26.)

Non-Residential Density. In non-residential areas the measurement of density in terms of buildings, rooms or occupants per acre can seldom provide any useful information, yet some comparative measure of the quantity of accommodation on different sites is necessary.

For this purpose a method based upon the floor space index has been devised. This is described in great detail in the Ministry of Town and Country Planning's handbook on the Redevelopment of Central Areas. The floor space index is the area of the total floor space of the buildings on any particular site divided by the area of the site, including half the area of any roads adjoining it. This gets over the difficulty of comparing directly the greatly differing sizes of buildings and rooms which obtains in non-residential areas. The F.S.I. survey can only usefully be applied to central areas of considerable size in which some redistribution of uses is contemplated.

The theory on which the F.S.I. survey is based is that sites can be developed up to various maxima of intensity according to their use, having regard to the need for a street system adequate to accommodate the traffic, both vehicular and pedestrian, to be expected in various parts of the central area, sufficient parking spaces and access for goods vehicles to buildings and satisfactory daylighting standards for buildings.

There are various practical difficulties which limit the usefulness of the F.S.I. survey. In the first place, if the town plan postulates an increase of population for the town, it by no means follows that accommodation for uses in the central area will need to be increased *pari passu*, for some uses may be able to serve considerable additional population without increased accommodation or the introduction of new firms.

Second, even in terms of existing population, it may often be extraordinarily difficult to find out whether the present central area accommodation is sufficient; it will frequently be the case that some firms are operating under a handicap because of cramped conditions, while others do not make full use of all their floor space. Yet others may have a sufficient area of floor space which is so awkwardly shaped and divided that it cannot be used to the best advantage.

Third, much of the redevelopment necessary in a central area is unlikely to take place for many years, and when it does take place the space requirements of some classes of users may have altered substantially.

Fourth, the maximum floor space indices fixed for the different use zones within the central area can at best only approximate to the optimum; they certainly are not capable of being exactly calculated, and, until a great deal of research has been carried out, whatever standards are fixed can hardly be regarded as more than intelligent guesses.

Fifth, at any given F.S.I., the proportion of site occupied by buildings obviously affects the area available for car parking.

All these considerations seem to indicate that although a floor space index survey of some kind is practically indispensable the expenditure required to carry out a detailed and meticulously exact survey is hardly justified.

The following method, based on that described in the handbook on the Redevelopment of Central Areas, using as many time-saving approximations as possible, is thought to be satisfactory, providing that those doing the fieldwork are reasonably skilful and experienced. Experiment has shown that, using this method, two men working in a densely developed central area can survey about four acres a day, although in places where the intermixture of uses is exceptionally intimate this would, no doubt, have to be reduced somewhat.

1/2,500 is too small a scale on which to work in densely developed areas. If there are no maps published to a larger scale, photostat enlargements of the 1/2,500 sheets to 1/500 will prove a great help.

The information which the survey seeks to obtain is twofold: first, a statement of the total floor areas devoted to each class of use within the central area, distinguishing only between quite distinct kinds of use, e.g., shop, office, place of assembly, in conformity with the land use survey notation, and, second, a picture of the intensity of use of each street block in the central area in terms of its overall floor space index. A street block is an area entirely surrounded by roads other than secondary means of access to the buildings, but not intersected by any roads. Although the street block will frequently be a satisfactory unit over which to give an average F.S.I., some may be sub-divided into two or more areas of markedly different use or character of buildings, and where this is so each sub-area should form the unit.

No calculation of areas should be attempted in the field, but where, as is often the case, some of the upper floors of a building are of less area than the ground floor, they should be shown as proportions of the ground floor area. Normally the land use survey will have been carried out before the

F.S.I. survey, and in this case it will be helpful, before setting out, to copy the land use survey colours lightly on to the field sheets, which should be cut to a convenient size to carry on a map board. It is essential to have a large blank margin for notes surrounding each field sheet.

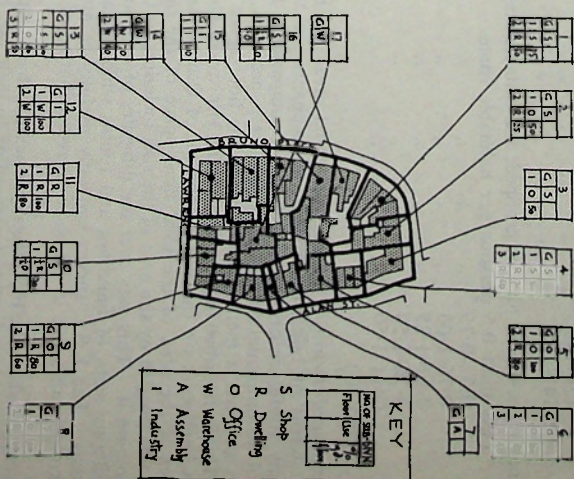
The procedure should be to mark all the information required on the field sheets so that tables of floor areas and F.S.I. maps can be prepared from them in the office. (See Fig. 22.)

SUMMARY OF FIELD SHEET

| Sub-Division No. | Floor Areas in Square Feet | | | | | Total Floor Area sq. ft. | Total Site sq. ft. | F.S.I. |
|------------------|----------------------------|----------|--------|-----------|----------|--------------------------|--------------------|--------|
| | Shop | Dwelling | Office | Warehouse | Assembly | | | |
| 1 | 4,375 | 1,250 | | | | 5,625 | 3,400 | 1.04 |
| 2 | 1,500 | 375 | 750 | | | 2,625 | 3,200 | 0.82 |
| 3 | 1,450 | | 725 | | | 1,875 | 3,300 | 0.57 |
| 4 | 4,800 | 3,120 | | | | 7,920 | 2,400 | 3.30 |
| 5 | | 1,280 | 3,200 | | | 4,480 | 2,100 | 2.13 |
| 6 | | 628 | 4,406 | | | 5,034 | 2,400 | 2.10 |
| 7 | | | | | 450 | 450 | 900 | 0.50 |
| 8 | 1,280 | 1,280 | 1,280 | | | 3,840 | 1,280 | 3.00 |
| 9 | | 2,695 | 1,925 | | | 4,620 | 1,575 | 2.93 |
| 10 | 1,690 | 760 | 760 | | | 3,210 | 2,800 | 1.15 |
| 11 | | 2,940 | | | | 2,940 | 2,450 | 1.20 |
| 12 | | | | | | 4,200 | 4,950 | 0.85 |
| 13 | 6,000 | 1,500 | | 2,800 | | 9,900 | 5,500 | 1.80 |
| 14 | | | | 7,245 | | 7,245 | 14,000 | 0.52 |
| 15 | | | | | | 7,000 | 6,300 | 1.11 |
| 16 | 1,925 | 577 | 577 | | | 3,079 | 4,400 | 0.70 |
| 17 | | | | 2,100 | | 2,100 | 3,000 | 0.70 |
| Total | 23,020 | 16,405 | 16,023 | 12,145 | 450 | 76,443 | 65,985 | 1.16 |

A sample F.S.I. survey field sheet and the information to be derived from it.

Fig. 22. An example of the kind of field sheet which needs to be prepared for a Floor Space Index Survey.



The method used is an approximate one; time should not be wasted in trying to secure a degree of accuracy for any particular site which will not be reflected in the final results as a whole. It should seldom be necessary to enter a building; a great deal of time will be spent in stating one's business and overcoming objections if this is done. External inspection of the windows of upper floors will nearly always enable a fair estimate to be made of the uses to which they are put, but every external wall of every site should be

looked at, since some floors may be in multiple use, and inspection of one side only may give misleading information. In such cases the estimate made of the proportion of floor space on any particular floor used for each purpose is likely to be very inexact, but any estimate short of actually entering and measuring up rooms—obviously quite impracticable—would also be inexact.

It may very often be impossible in business areas to tell by visual inspection

how much of the unbuild-on space within a street block belongs to any particular building or part of a building. Where this is so a commonsense division should be made. The survey is for the purpose of estimating future needs, and the recording of illogical distributions of unbuild-on space, which will often be due to purely fortuitous circumstances, will not help such estimates.

Measurement of the areas of buildings and sites is carried out in the

office after the fieldwork has been completed. Although it is possible to do this by planimeter, scaling dimensions and doing the necessary multiplications by slide rule will probably be quicker and nearly as accurate.

If lack of funds or labour, or the relatively small amount of useful information expected from the survey in a particular town precludes even the approximate method just described, it is possible to get some idea of non-residential building quantities by an even more rapid method. The only fieldwork which this involves is to note the number of storeys of each building. The rest of the work would be done from the map and would consist simply of calculating the areas of buildings and sites as before, multiplying each building area by the number of storeys and taking the predominant use of each building, as indicated by the land use map, to be its sole use. Reduction of floor areas on upper floors due to setbacks would be ignored.

Clearly, such a survey would fall a long way short of accuracy, yet it would probably be better than no survey at all. It would assume that all uses of buildings, other than predominant uses, were purely ancillary, and this is often not far from the truth; it would exaggerate the total amount of floor space in the central area, but in many towns the error caused by this would not be dangerously large.

In each area made the subject of a F.S.I. survey note should be made of the existing F.S.I.s of one or more buildings or blocks devoted to each principal use which seem to function satisfactorily in regard to all the functions affected by F.S.I., so that regard may be had to these in fixing suitable maximum F.S.I.s for each use.

It should be noted that in connection with F.S.I. surveys the term "central area" is not necessarily confined to a single area for each town; in some very large towns there may be subsidiary centres where the quantity, variety and congestion of non-residential uses are sufficiently great to necessitate an F.S.I. survey as a preliminary to formulating Plans for redevelopment.

In London the "Plot ratio" is used to measure non-residential density instead of the "Floor Space Index". The only difference between the two is that Plot Ratio is measured over the net site, half widths of roads being ignored. As a measure for control of development of individual sites Plot Ratio is probably the better, since it prevents the unduly dense development of a site, such as a corner site, which happens to be adjoined by an exceptionally large area of road. For purposes of comprehensive development or redevelopment, however, Floor Space Index is clearly more useful.

8.4. THE AGE AND CONDITION OF BUILDINGS

History of Growth. This survey which can be mapped at a scale of 6 in. to one mile, or even 1/25,000, is one of those which provides the planner with general background information rather than specific pointers to solutions of problems. It tells him which parts of the town area were most popular for development, at different periods, the main directions of growth and the speed of growth in different directions. It is an easy map to prepare, in fact, many experienced Planners could prepare a fairly accurate one for a

town of which they had no knowledge simply from the different types of layout, density, shapes of houses, etc., shown on the 1/2,500 map.

The method used is to colour or otherwise distinguish between areas first developed at different times, ignoring very small patches of development of a different period. Not very many periods should be distinguished and the dates selected should be arranged to coincide as nearly as possible with significant events in general history or the history of housing. Suitable dates would be:

- Development before 1875 (The Public Health Act).
- „ between 1875 and 1914 (First World War).
- „ „ 1914 and 1939 (Second World War).
- „ since 1939.

In addition, the earliest developed portions of the town should be distinguished; these often show very clearly the reasons for the town's origin and the form of its subsequent development. The date selected should be that of the earliest obtainable map of the town which is drawn sufficiently accurately for building sites on it to be positively identified; some very old maps are hopelessly indefinite.

Areas developed during succeeding periods can be identified from maps published at various times. It may not be possible to obtain maps of exactly the right date, but 6in. to one mile Ordnance maps were published for most areas about 1880, which is near enough to 1875. These can be found in public libraries, museums and local authority offices. In one public library, at least, they are the maps offered for inspection to people who want general, not historical, information about the town!

Similarly, other 6in. to one mile maps were published for most areas at various times between 1909 and 1914.

Assuming that fully up-to-date maps are available, as they should be (see page 95), it is a simple matter to identify the development between 1914 and 1939, since this only involves subtracting the readily identifiable post-war development.

It should be noted that a history of growth map is not quite the same thing as an age of buildings map. The latter shows the date at which the buildings at present on a site were erected, the former the date at which buildings were first erected in different parts.

Conditions of Buildings. A careful survey of the condition of buildings within a town is of great importance.

Condition surveys have one special characteristic: they are used to assist in determining programming, or the order in which Planning proposals are intended to be implemented far more than in deciding the actual nature of the proposals, but they do have some effect in this way also.

As a matter of simple economics it is desirable that those buildings most nearly worn out should be replaced before those which are still comparatively serviceable. In the case of urgent projects which involve the demolition of buildings, such as the construction of an inner ring road, detailed knowledge of the relative condition of buildings which lie within the possible limits of deviation of the route will greatly help to secure the optimum

efficiency and economy; in many cases the selection of a route which requires a comparatively small expenditure on the acquisition of buildings in its path may be a decisive factor in securing that the project is in fact carried out.

For the general purposes of preparing a Town Map the degree of detail entered into by the Condition Survey need not be nearly as great as for the precise determination of a by-pass route; areas rather than individual buildings should be considered. The principles concerned are the same in either case but it is likely that information readily available from official sources will more often relate to the detailed conditions of small areas than to the relatively broad comparisons required for Town Map purposes. Official information, such as that prepared for slum clearance purposes, apart from covering too small a part of the town, is often, detailed though it may be, ill-adapted for purposes of comparison and is apt to include official wording which cannot be penetrated, and does not describe the real nature of the defects. This is of some importance because the selection and programming of areas for clearance by Local Authorities is not always done solely in the light of the impersonal technical data which are needed for Planning purposes. The personalities of councillors and political promises may well determine the choice of a particular area for early clearance rather than its physical decrepitude as compared with other areas.

Nevertheless, unless inordinate time and expense is to be incurred in carrying out a Condition of Buildings Survey, official information will largely have to be relied upon. Sanitary and Building Inspectors are often able to provide information which can be built up into a reliable estimate of condition although it was not originally collected for the purpose of deciding the relative urgency of redevelopment in different parts of the town.

There is little doubt that the best way of assessing the relative condition of buildings is to select a number of significant factors making for bad condition, to plot the incidence of each, and, by means of a sieve map, to determine the areas affected by many, few or no factors.

It is important that the factors chosen should not only be those which have a marked effect on condition but that they should be selective; if, as is common, hardly any of the houses in a town which were built before 1914 have bathrooms it is very little help to record the fact on the Condition of Buildings Map.

It is also necessary to choose factors which cannot be easily or economically changed. To take as an extreme example a factor which, for all its absurdity, has in fact been used, the existence of overcrowding in a house is no evidence whatever of its bad condition as a building. To take a case which may well cause genuine difficulty, the excessive smallness of rooms in the houses would often be a useful factor but the design of some houses might well be such that they could cheaply be converted into satisfactory dwellings by knocking two rooms into one.

The actual factors chosen and the number used must depend upon the physical circumstances in each individual town and, for the sake of economy of effort, upon what information already exists. It will usually be better to use not more than four important and selective factors than a larger

number of less definite ones. Selection must also be affected by the time and money which can reasonably be devoted to the survey.

Conditions vary so much in different towns that no general rules can be given, but the following is a list of factors from which a selection might be made:

- Net density in excess of 120 habitable rooms per acre.
- Daylighting seriously inadequate.
- No bathroom.
- No indoor sanitation.
- No separate sanitary accommodation.
- No piped water supply.
- No main drainage.
- Rooms excessively small.
- Dampness.
- Bad structural condition.
- Inadequate garden or back yard space.
- Proximity of detrimental uses (noxious industry, etc.).

A small amount of fieldwork will probably be necessary in order to check the building inspector's views on structural condition, so that buildings with comparatively minor and remediable defects shall not be included.

Obviously the areas subject to the greatest number of unfitness factors are, *prima facie*, those in most urgent need of redevelopment.

A survey of this kind is likely to provide information much more valuable than that to be obtained from the more generalised survey usually undertaken. For example, Max Lock's Middlesbrough survey concentrated on three factors: age greater than 70 years, density above 50 houses per acre and lack of bathrooms, and did not give sufficiently selective information to provide satisfactory material for a comparatively short-term programme. It is only fair to add that this survey was carried out immediately after the war, when the prospects of extensive and early redevelopment seemed much brighter than they do now, and the need for selectivity therefore seemed less.

It may be necessary to make separate condition surveys for non-residential areas, such as old industrial areas, where unfitness factors different from those used in the residential condition survey may be the most suitable.

8-5. FACTORS LIMITING DEVELOPMENT

This survey map is little more than a reproduction at a larger scale of the sieve map described in Chapter 5. (Fig. 12.) Any more detailed information which can be obtained for the area surrounding the town should be included. The collection of this for the whole region would frequently entail too much work to be justified but is of great assistance in selecting precise areas for future development. This information would probably not introduce fresh subjects, but would give a greater accuracy of boundary for the areas affected by the various factors. For example, any detailed local levelling operations which had taken place could be utilised to delineate areas of steep slope more precisely than could be done from published information.

It will often be of great importance to determine areas which can be

drained by gravity into the existing sewerage system. Assuming that the system, or the particular part of it concerned, is capable of dealing with substantial additional volumes of sewerage, it will be far more economical to develop such areas than to resort to pumping or to create a separate sewerage system draining to a new sewage works. It may even pay to use the existing sewage works, if its capacity is sufficient, even though new main sewers have to be laid to supplement those existing.

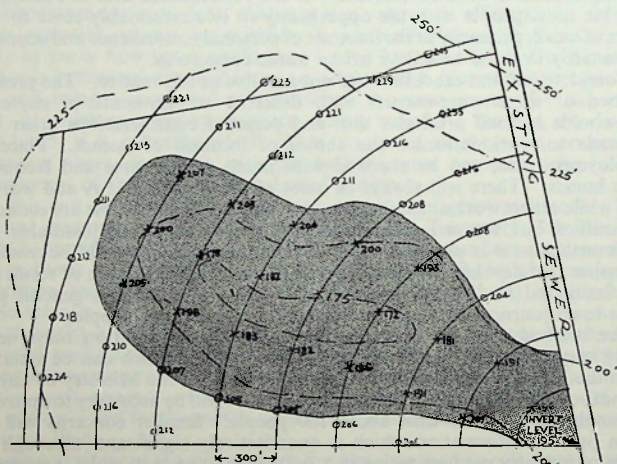


FIG. 23. Land not capable of being sewered by gravity is stippled. An illustration of the method of determination of such areas is described on this page.

The following is a method of determining rapidly and approximately the practicability of draining land by gravity; the work can be done considerably more speedily than would be supposed from the description.

The process is illustrated in Fig. 23.

- (1) Obtain a 1/25,000 fully coloured Ordnance sheet covering the land to be examined. Transfer the contours crossing this land to the corresponding 1/2,500 or 6 in. to one mile Ordnance sheet. (The 1/25,000 scale is too small to work on.)
- (2) Ascertain the invert level of the lowest accessible point of the nearest existing sewer and plot its position on the map, showing the height above datum of the invert level.

- (3) Cover the area to be examined with a series of arcs drawn from this point, at intervals of about 300 feet.
- (4) Figure the estimated ground levels along each arc. This can be done with fair accuracy by studying the contours intelligently.
- (5) Determine which of these points can be drained into the sewer by gravity by applying the following formula :

$$\text{Level of point} - \left[\left\{ \begin{array}{l} \text{Distance to} \\ \text{selected point} \\ \text{on sewer} \end{array} \right\} \times \left\{ \begin{array}{l} \text{Flattest} \\ \text{acceptable} \\ \text{gradient for} \\ \text{future sewers} \end{array} \right\} + \left\{ \begin{array}{l} \text{Least} \\ \text{acceptable} \\ \text{depth below} \\ \text{surface for} \\ \text{inverts of} \\ \text{future sewers} \end{array} \right\} \right]$$

If the resultant figure is greater than the invert level of the existing sewer the point can be drained into the sewer, if less it cannot.

It will not, of course, be possible to determine accurately the flattest acceptable gradients for future sewers, since this depends upon their sizes, but the whole process is in any case an approximation and since the actual routes of the future sewers are not known and can, within limits, be varied to suit the contours, 1 in 300 is a reasonable figure to take. Five feet and eight feet are reasonable minimum and maximum depths of invert below the surface.

The points which, it appears, can be drained should be ringed and the points which cannot be drained should be marked with a cross. The land which can be satisfactorily drained can then be seen at a glance.

This method does not, of course, take account of land which is so steep that it prevents economical drainage, but skill and ingenuity in designing the routes of sewers will generally enable this difficulty to be overcome, whereas no ingenuity can make up for insufficient fall being available. The approximate nature of the results obtained from this method must be stressed. Much depends upon accurate estimation of the levels of the land.

8-6. CATCHMENT AREAS

In preparing the town plan it is useful to know the catchment areas or areas of influence of various public services, since the formation of satisfactory neighbourhood boundaries can sometimes be based on them.

The process is much the same as that described in Chapter 5 for determining the areas of influence of urban and rural settlements, but over a smaller area of more intense utilisation.

The factors used must be carefully chosen to indicate, so far as possible, the exercise of free choice. Schools, for example, are not a very satisfactory service from this point of view because administrative boundaries have a considerable influence upon their catchment areas. Shops, cinemas, pubs. and churches are better because freedom of choice is untrammelled. But even these are not perfect.

The factors governing choice are not solely related to convenience of location of access, or even the less easily assessable factors of social homogeneity—the tendency of groups of people with similarity of needs and out-

look to carry on most of their day-to-day activities within the area inhabited by that group. The fact that a particular kind of shop is missing from one local group of shops but not another, the film circuit to which a cinema belongs, and hence, to some extent, the kind of film shown, the brew provided at a particular pub. and the personality of its landlord, the personality of the minister at one church compared with another, may all exert a substantial influence upon areas of influence. Furthermore, these are all factors liable to sudden change, while Planning is concerned with the much more permanent spatial distribution of general kinds of land use, so that the practical usefulness of mapping such local areas of influence in connection with the preparation of a development plan is necessarily limited.

But the usefulness, though limited, does exist. The coincidence and overlapping of the boundaries of different areas of influence can reveal the existence of common interests and social partnership throughout areas, which could not readily be deduced from inspection of map or ground, and it will usually be desirable to arrange Planning proposals with a view to preserving and enhancing such areas, which can properly be regarded as neighbourhoods in more than a purely physical sense.

The factors selected for mapping areas of influence should not only be free from artificial distortion but should be services used by the community as a whole, not merely by comparatively small sections of it. In the case of the local survey it will probably be quicker and more accurate to go to the suppliers of the services and obtain from them information as to the areas which they serve than to go to the consumers, although this may have to be done in cases of doubt or non-co-operation.

The boundary of the catchment area should be drawn so that it excludes exceptional outlying users who probably have special individual reasons for using that particular centre. To borrow a military term, the effective beaten zone rather than the 100 per cent. beaten zone should be mapped, and to do this it is probably safe to omit the most remote 10 or 15 per cent. of users.

Clearly the mapping of areas of influence can only be usefully done for sub-centres, since the area of influence for many of the services supplied in the central area will be the whole town, and, as shown in Chapter 4, a considerable surrounding rural area. It will be useful to show theoretically desirable areas of influence on the map, as well as existing areas, in the form of circles of appropriate radius with their centres at the site of each existing service. Nursery schools, it is often said, should be sited so that no child needs to travel more than a quarter of a mile to get to one, small groups of shops supplying everyday needs should be sited at similar intervals, while larger local shopping centres and infant and junior schools might appropriately be provided within half a mile of all dwellings. A comparison of existing and ideal catchment areas will be helpful in indicating the appropriate location of new local service centres intended to serve both existing development and near-by proposed development.

I cautiously advance the view that, if time presses heavily, the mapping of ideal areas of influence only may well suffice as a guide to Planning proposals unless the existing town structure is exceptionally complicated.

8-7. RELATIONSHIP OF PLACE OF WORK AND HOME

We turn now to the determination of another kind of catchment area of importance in the case of large towns of, say, a quarter of a million population or more, where the developed area is so large that the part of the town in which a worker lives may depend upon the location of his place of work because of the distances involved. Briefly, it is essential that the Planner should know, in general terms, where the bulk of the workers in a particular residential area work, and, conversely, the area from which large centres of employment draw their workers. It is a fundamental aim of Planning to provide most people with the opportunity to live reasonably close to their place of work, primarily in the interests of personal convenience and economy, secondarily in order to relieve urban traffic congestion.

Completeness and exactitude are not possible in this matter. The presence of two or more wage-earners with different employments in numerous households in itself precludes this, and personal considerations other than nearness to work influence the choice of location of homes. Places of employment, too, can be changed with much greater ease and frequency than homes. There will always be cases of people living at A and working at B while others work at similar jobs at A and live at B. These are economic absurdities, but, for various human reasons, are abundantly justifiable.

Nevertheless, it is essential that sufficient information should be available to ensure that development and redevelopment proposals, both of residential and industrial areas, shall not inevitably bring about crazy, general post, cross-town journeys to work for substantial numbers of people.

The method used for collecting the necessary information must necessarily vary according to the degree of co-operation which can be obtained from the Ministry of Labour or from employers. If the Ministry of Labour cannot supply sufficiently detailed information it will be necessary to approach all employers of more than about 100 people. Smaller concerns will not often provide information which is quantitatively significant, although the kinds of industry predominating in a particular town may make it advisable to adjust this datum figure upwards or downwards.

A list of addresses of employees would enable a catchment area for each concern to be mapped. Some firms, though co-operative, might feel that they were not entitled to divulge the private affairs of their employees, even to the extent of providing addresses, since a Local Planning Authority with sinister designs (though what these might be it is difficult to imagine) could readily relate addresses to names by the use of a local directory. In such cases information limited to the names of streets and not to particular numbers would be adequate, since employment catchment areas do not need to be defined as precisely as local supply service catchment areas.

The map prepared from a survey carried out by inquiry from employers should prove sufficient to meet Planning needs; it is, of course, only a one-way survey; it shows where concerns get their workers but does not show where all the workers living in a particular locality work; a sample survey will, however, enable a fair estimate of the latter to be made. A good example of such a survey is shown in Plate VII of "When We Build Again", the Birmingham Planning Survey. This shows, by means of a series of

diagrams, the places of work of the inhabitants of each main residential area.

8-8. TRAFFIC CENSUS

Brief reference has already been made in Chapter 5-3 to the need for information about traffic volumes on main through routes. At the local level the subject is also of importance, and the information needed more detailed. It is easy enough to see which of a town's streets are frequently seriously congested, but less obvious how to apply remedies, and the cost of road improvements is so great that mistakes cannot be afforded.

It is essential, where the situation is not perfectly straightforward, not merely to know how much traffic uses a road but what kind of traffic it is; whether it is through traffic having an origin and a destination outside the town and using a congested route through the town merely for lack of a better, in which case the appropriate remedy may be a by-pass, or, on the other hand, if it is traffic which either originates in the town or has its destination there, in which case the remedy must necessarily lie in the improvement of the town's internal road system.

To this end an origin and destination census is of great assistance. The technical memorandum issued by the Ministry of Transport with Circular No. 612, provides valuable information about how to conduct such surveys. Four methods are described: (a) by direct interview; (b) by observation of registration numbers; (c) by the use of postcards, and (d) by attaching tags to vehicles.

Of these (b) is the only one which can be carried out without interference with road traffic and which could therefore be done at short notice without elaborate preparation and the co-operation of other authorities; although not the most accurate method, there seems no reason why it should not serve perfectly well for diagnostic purposes in connection with the preparation of a town Plan.

Those carrying out the survey work in pairs, one man to call out numbers, the others to book them. Usually, a pair will be required for traffic moving in each direction at each census point, and a census point must be established at each entrance and exit to the town. In order to facilitate observation they should, obviously, be established at points where traffic necessarily has to travel slowly.

The number of each vehicle, its type, e.g., private car, lorry, tradesman's van, and the time it passes the census point are noted. By comparing the lists of each pair of observers the track of the vehicle through the town can be discovered. Where there are several alternative routes through the town internal census points will be necessary to establish this with certainty. Tests must be made to establish the normal time taken for a vehicle to pass between census points, and any which exceed this by more than twenty minutes are assumed to have made a call in the town—i.e., not to be through traffic.

A day must be chosen for the census when traffic conditions are normal. Where there is more than one traffic problem it may be necessary to do more than one census. For example, a market town such as Maidstone, which

is also situated on a main route between London and South Coast resorts, may suffer severe traffic congestion both at the time of the weekly market and at week-ends in the summer. It is unlikely that the congestion from each cause will be at the same points, and it will be necessary to seek a remedy which will alleviate both.

The office work necessary to analyse the results of an origin and destination survey is great, and such a survey should not be lightly undertaken.

8-9. RESEARCH AND SOCIAL SURVEY

We need to know many basic facts in relation to Planning which have a more or less universal applicability. Is there a critical gradient above which development of land becomes materially more expensive? How can the degree of flooding which is seriously prejudicial to building be determined in relation to particular sites? Above what intensity of use do grass verges of streets become too trampled to be worth while? What floor area per worker is needed in different kinds of factories? What maximum F.S.I.s are appropriate for different central area uses? How many shops per 1,000 people should be provided in a local shopping centre?

These are all questions which need answering, and none of them, so far as I know, can at present be answered with any real confidence. It is the function of *research* to find these answers, to establish authoritative yardsticks, while it is the function of *survey* to establish the facts relating to any particular area by reference to those yardsticks. A great deal of this kind of research needs to be done, yet the responsibility for carrying it out, the co-ordination of programmes, and even the subjects to be tackled have not yet for the most part been clearly stated.

It will have been observed that the questions asked above begin by dealing with purely objective physical facts, but introduce matters dealing with opinion and social habit. In respect of these latter questions the sociologist, who specialises in the analysis of human needs, desires and habits, has an important contribution to make.

With his entrance we are immediately plunged into consideration of extremely difficult philosophical, political and practical problems, almost inextricably interwoven. Very clear and honest thought is necessary to sort them out and come to valid conclusions. It is solely in the interests of clarity that the following points are stated in somewhat dogmatic fashion; each is susceptible to argument.

First, it can confidently be asserted that, in relation to Town Planning, sociological investigation is useless unless it answers questions in such a way that the answers help to determine the optimum distribution of land uses and building types. It is only by insistence on strict relevance to realisable Planning aims that the danger of getting lost in seas of unassessable information of doubtful relevance can be avoided. It is, of course, true, as with other aspects of Planning, that too harsh an insistence on direct relevance may prevent the emergence of much useful information, but the connection with action which is legally, politically, and economically feasible must not be lost.

It is absolutely essential that Planning should be entirely dissociated from

sectional attempts to influence social pattern and behaviour, however enlightened and well meaning. It must be the Planner's aim to produce a physical environment in which rich and varied activities can flourish, in which religious, social and political gatherings, sports, work, education, amusement, lovemaking and trade can all be carried on at their highest pitch, but it is entirely illegitimate for him to seek to influence the particular way in which such of these as involve social organisation are run.

It is clearly impossible to consult all the potential users and occupiers of land and to meet all their conflicting wishes regarding the details of layout. It is the duty of democratically elected representatives to create what they conceive to be the optimum arrangement in the case of public development and to require it (so far as it is in the public interest to do so) in the case of private development. To what extent the wishes of the public generally are met as regards the provision of flats rather than houses, of terrace houses rather than semi-detached, and in architectural style, is extremely doubtful.

It is no part of my design, even if I were competent to do so, to embark on a treatise concerning sociological method, but a few notes regarding the kind of information useful for Planning purposes which point out some elementary pitfalls may be helpful to the Planner who is forced to undertake sociological investigation without expert assistance.

To be helpful, information of this kind, which may be obtained by personal interrogation, the filling in of questionnaires, or partly by both methods, must be relevant, representative and realistic.

As regards the first, at the risk of becoming wearisome, I emphasise that the information obtained must in some way be capable of being translated into terms of the distribution of land uses; as regards the second it is obviously essential that all classes of opinion should be obtained; as regards the third, the form of question must not be of the "Have you stopped beating your wife?" or even "Would you like a net income of £5,000 a year?" type. It must be capable of eliciting an unambiguous answer related to practical possibility.

For example, it would be of little use asking the inhabitants of a large town acutely short of land whether they would like quarter-acre gardens and 18-hole golf courses adjoining all residential areas. "Would you like?" must be accompanied by an indication of the sacrifice which may be involved if the wish is granted.

Again, when it is a matter of choosing between alternatives it is not much use asking the opinions of people who have no knowledge of one of the alternatives. For example, an expression of preference for a semi-detached house rather than a terrace house is of little value if it comes from people who have never seen, let alone occupied, a well-designed modern terrace house. Similarly, preference for a house rather than a flat is of small value from people who have no knowledge of really well-designed flats unless the reasons given for the preference are independent of the kind of flat visualised.

The kind of thing which needs to be brought to light is the proportion of people who really welcome gardens of different sizes, the proportion of people who really prefer a good flat to a good house, the kind of leisure

activity in which people indulge, the number of rooms and disposition of functions between the various rooms which are desired, and so on.

The framing of questions demands extraordinary care, for an apparently clear and unbiased question may, through some accidental infelicity of wording, evoke a misleading response. For example, it has been related that when members of a somewhat poverty-stricken coloured community in the United States were asked if they were in favour of taxing profits a surprisingly small number of affirmative answers were given. The people concerned were in the "Bible belt" and most failed to distinguish between "profits" and "prophets". Again, questionnaires asking people whether they consider that they belong to the upper class, middle class or lower class have been known to bring quite different patterns of response than when the same people were asked whether they considered themselves to be members of the upper class, middle class or *working* class. "Working class" has not the pejorative ring of "lower class".

Other sociological investigation takes the form of detailed analysis of the structure of communities, their social ranking and social homogeneity. A whole section of Max Lock's Middlesbrough Survey and Plan, written by Ruth Glass, is devoted to this kind of study. With great respect, and fully conscious that the error may well be mine, I am bound to say that much of this seems to me altogether irrelevant to the purpose of preparing a Plan, however great its sociological interest and significance.

Demography, or the study of population is an important branch of sociology. Probable future changes in population due to natural increase and changes in family structure are of vital importance to the Planner, but most decidedly not a suitable subject for investigation for anyone but a qualified statistician. This applies, too, to the study of migration from one area to another, which, in the absence of any counteracting Planning action, may have important effects upon the population of an area.

8-10. DETAILED SURVEY

Detailed survey relates to areas of neighbourhood unit size or less, for which detailed Plans (known as comprehensive development area maps or supplementary town maps) have to be prepared. It will be necessary to take sufficient levels for contours at 5ft. vertical interval to be interpolated. Information about all natural features, including those such as copses, small quarries, hedges, and individual trees, which are too small to have been considered at earlier stages of survey, are required and the routes, depths and capacities of all public services. Details of any existing buildings, tracks and roads will also have to be obtained. In short, it will be necessary to obtain all the information which a prudent developer would wish to have before deciding on the form of development to be undertaken. The sieve technique of survey analysis can still be employed here in a modified form; all areas of steep slope and unfavourable aspect should be mapped. The detailed levels obtained will enable this to be done very accurately.

Small areas of special beauty which it would be appropriate to keep as local open space should also be marked. The sieve map should build up to give a picture of all the individual small areas of land which ought not to

have buildings actually placed on them (although some of them may form parts of the curtilages of buildings). Detailed analysis of this kind can do a great deal to reduce the labour of formulating satisfactory detailed proposals.

8-11. VILLAGE SURVEY

Villages in which substantial development or redevelopment is contemplated will require individual consideration as regards the amount and nature of local survey necessary. There is no point in using a sledge-hammer to crack a nut; normally all that should be needed is a detailed land use survey, a sieve map dealing with physical characteristics, and an investigation of the routes and details of public services. The area dealt with is usually so small that local survey and detailed survey can be combined.

8-12. SURVEY FOR NEW TOWNS

Only a brief word need be said about survey work before the preparation of a Plan for a New Town, which will never exceed the scope of that required in connection with an existing town, and, in the case of a virgin or *démievierge* site, will be limited to physical surveys: topography, agricultural value, landscape features, ease of provision of services and the like. Only if the site has a substantial amount of existing development upon it will density and condition surveys be important. It may well be, of course, that very elaborate investigations have to be undertaken in order to determine the practicability of providing water supply or dealing with the disposal of sewage, but upon these depend whether a particular site is in fact selected for a New Town, so that they form part of the process of regional survey.

8-13. CONCLUSION

Survey is a continuing process of very great social and economic importance. Even the most backward authorities will, in the course of

their quinquennial revision of survey, have the opportunity of bringing their surveys to a reasonable degree of completeness and satisfactory presentation. Such surveys have uses far wider than the mere preparation of statutory Development Plans; they constitute a record of value to all land users, industrialists, traders and administrators. Lack of space has prevented consideration of the ways in which a Planning survey can appropriately be modified and extended to be of special use to bodies other than the Local Planning Authority, but there is scope for much useful co-operation in this way.

Other countries which have not yet adopted a full land Planning policy will sooner or later begin Planning survey, so that although much of the most important local survey work has already been done in this country, no apology is offered for a fairly thorough treatment of the subject, based on the assumption that a complete programme of fieldwork and map preparation is feasible.

Finally, lengthy though this chapter has been, it contains little regarding the tabulation and written analyses of surveys, which will often be needed. The essence of survey is presentation in map or diagram form; tabulation presents no considerable problems, and involves merely a somewhat wearisome process of measurement and calculation. This can, I suggest, well be left to the imagination of the reader. The kind of tabulation I refer to is the compilation of tables showing total areas devoted to open spaces of various kinds, total shop frontages, total areas devoted to each kind of land use, calculation of overall town density and so on. This work can be elaborated indefinitely, but the survey maps are the basis for practically all of it; most of it should only be undertaken as and when the need for a particular item becomes apparent, otherwise a great deal of written junk, seldom or never referred to, is likely to be amassed.

Figs. 24 to 33 illustrate local surveys and Town Plans based upon them.

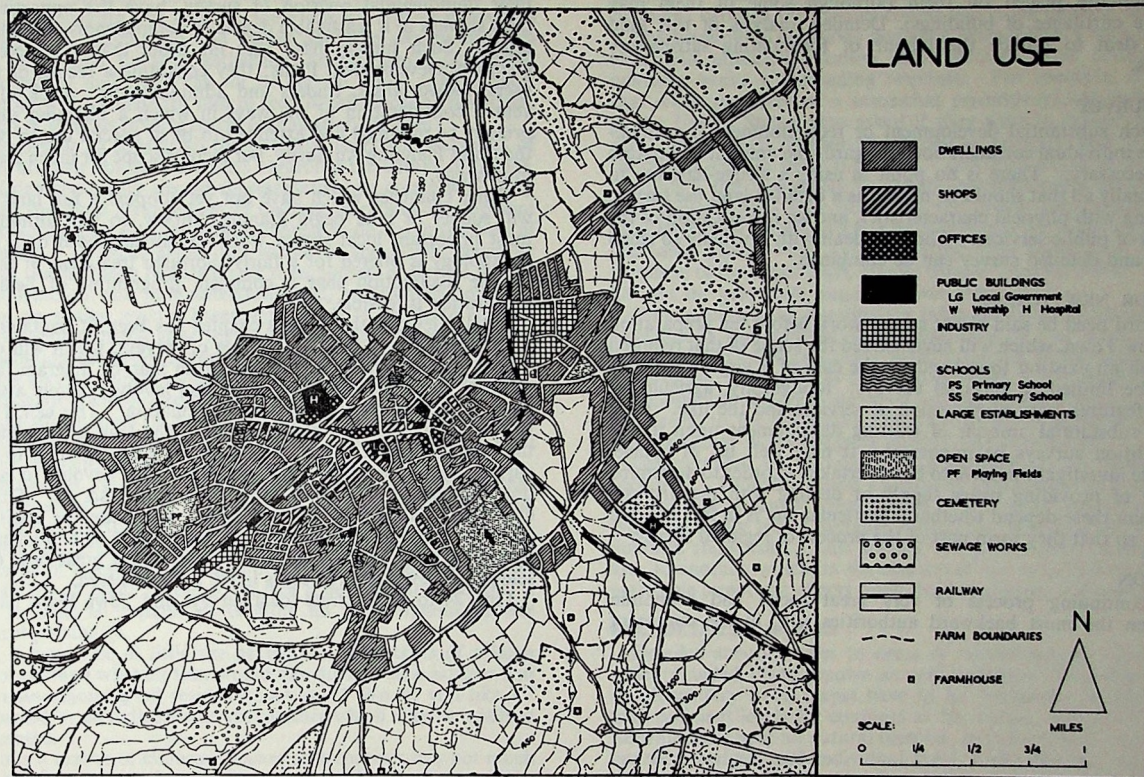


FIG. 24.

FIGS. 24—32. The following illustrations show summaries of surveys carried out for TREMEL and the TOWN MAP and PROGRAMME MAP prepared. The proposals conform with those in the first and second stage Regional Plans shown in Figs. 13 and 14.

The present population of the town is 58,420 and that proposed under the Plan 70,420.

Tremel is to be imagined as a town in a state of serious physical decay but of considerable business and industrial importance. As shown in Fig. 11, it imports considerable numbers of workers, who, under the Regional Plan, are to a large extent to be found work elsewhere. To replace these it is proposed to expand Tremel in order to receive 12,000 additional population, the result of metropolitan decentralisation. The large increase of land for industrial purposes, however, is needed almost entirely to relieve the very severe congestion under which industry in Tremel at present labours, not to create new places of employment.

The expansion of Tremel also provides the opportunity to regroup the present very

scattered Central Area Uses,^a a process facilitated by many of the buildings concerned being old and in bad condition.

In other respects the Plan follows fairly conventional lines, but one special point is worth noting. Topographical difficulties prevent even outward growth from the centre and also make it appropriate to provide a quite unusually large amount of parkland, since there are substantial areas of land quite near the centre of the town which it would be uneconomical to build upon, and for which the only reasonable use is as parks.

As explained in Chapter 9, during the processes of redevelopment a great deal of amendment to the layout of roads would naturally occur, but the Town Map is concerned with changes of use and of fundamental structure so that only those road proposals which affect the Town as a whole are shown.

Opportunity is taken to provide for the eventual removal and inclusion in open space or restoration to agriculture of several outlying ribbons of housing.

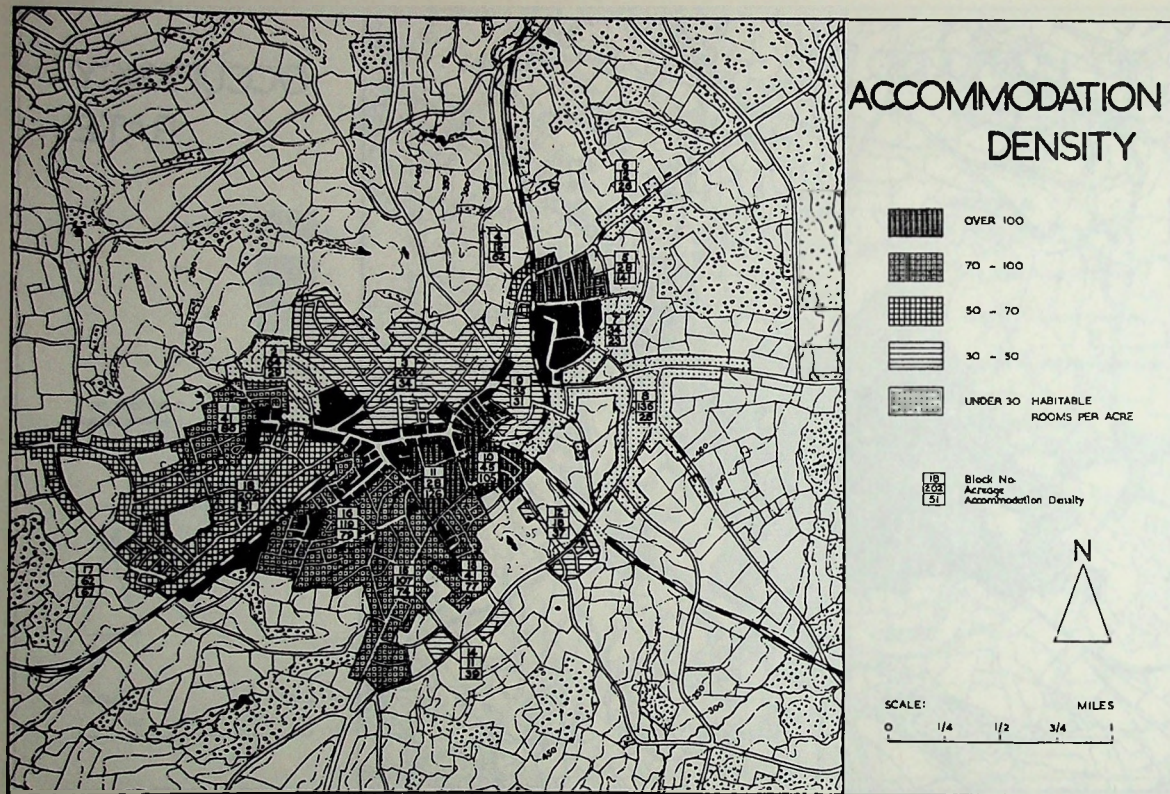


FIG. 25.

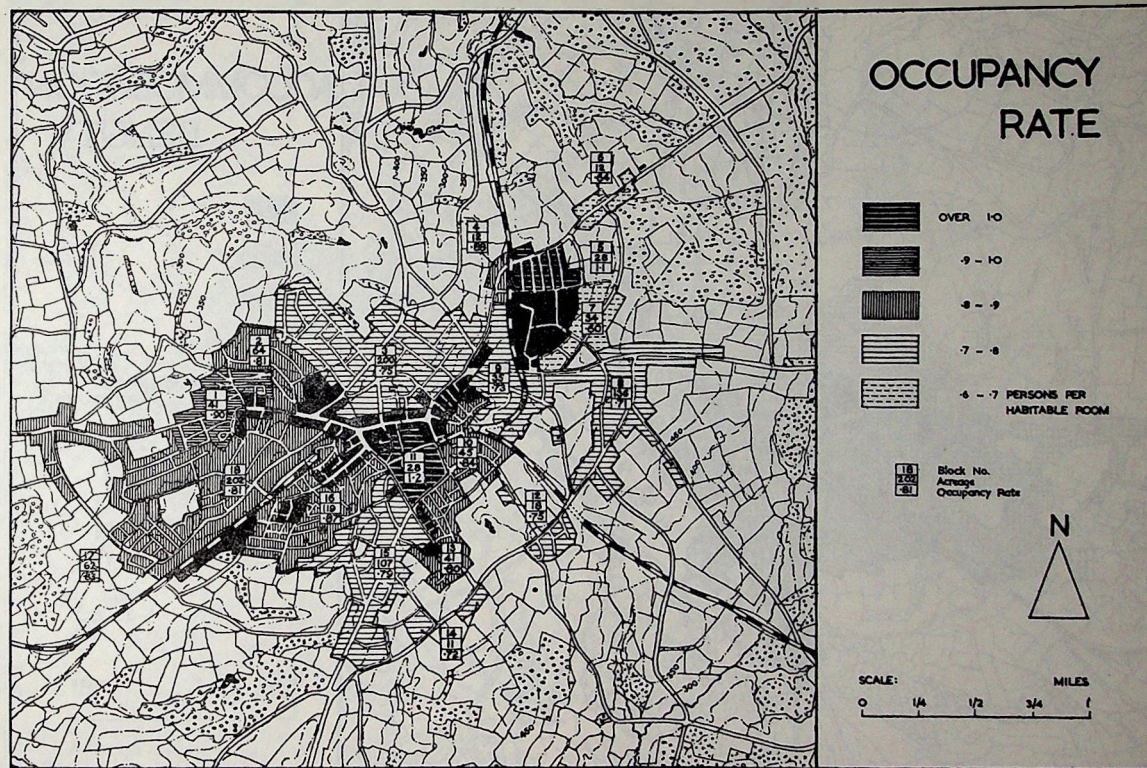


FIG. 26.

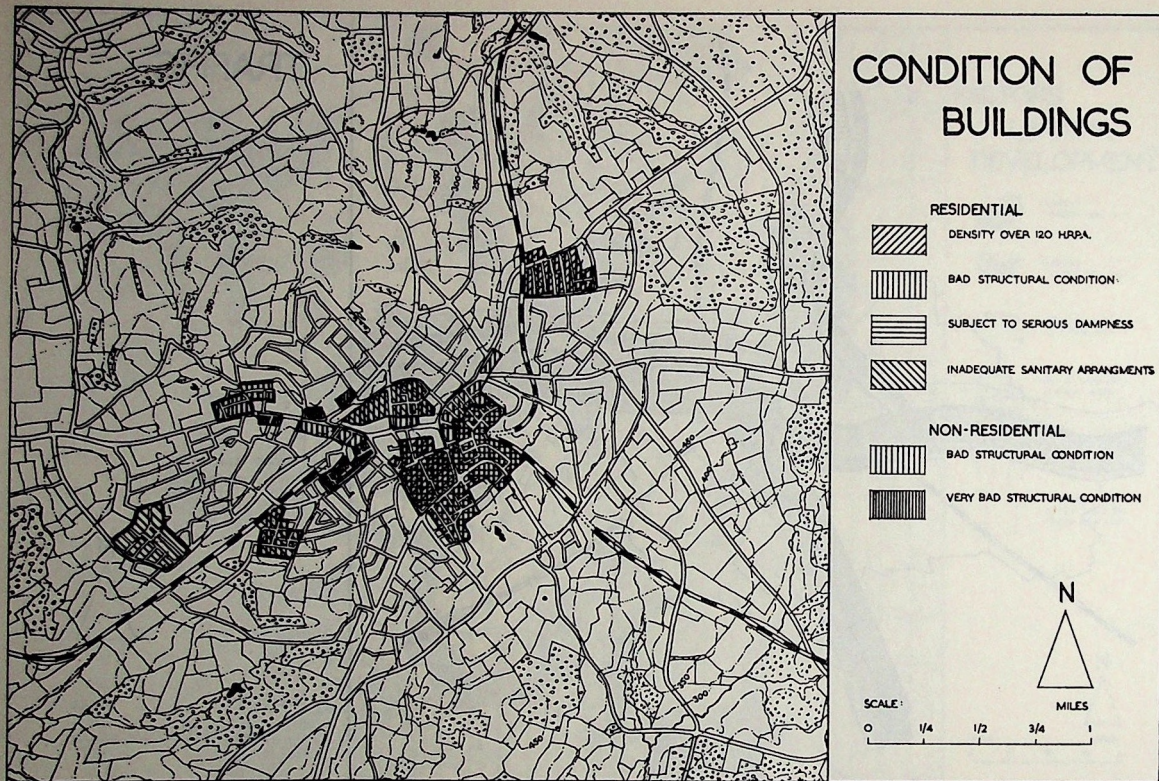


FIG. 27.

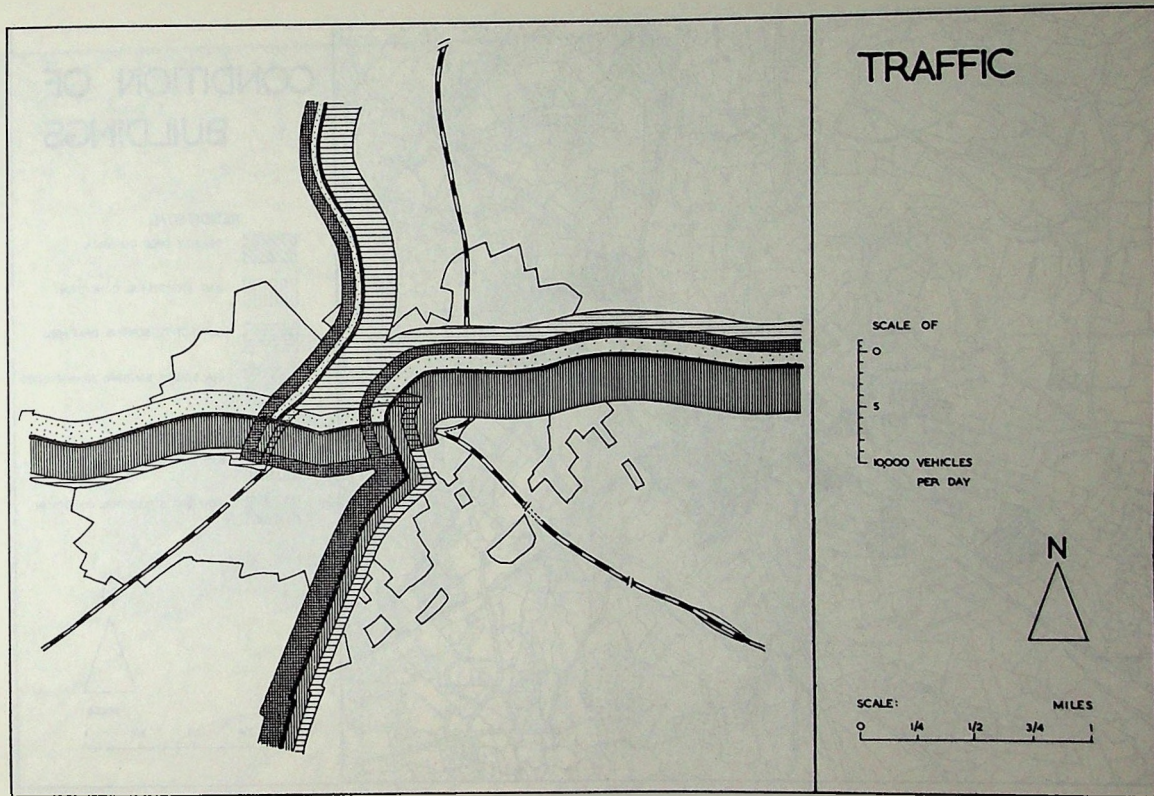


FIG. 28.

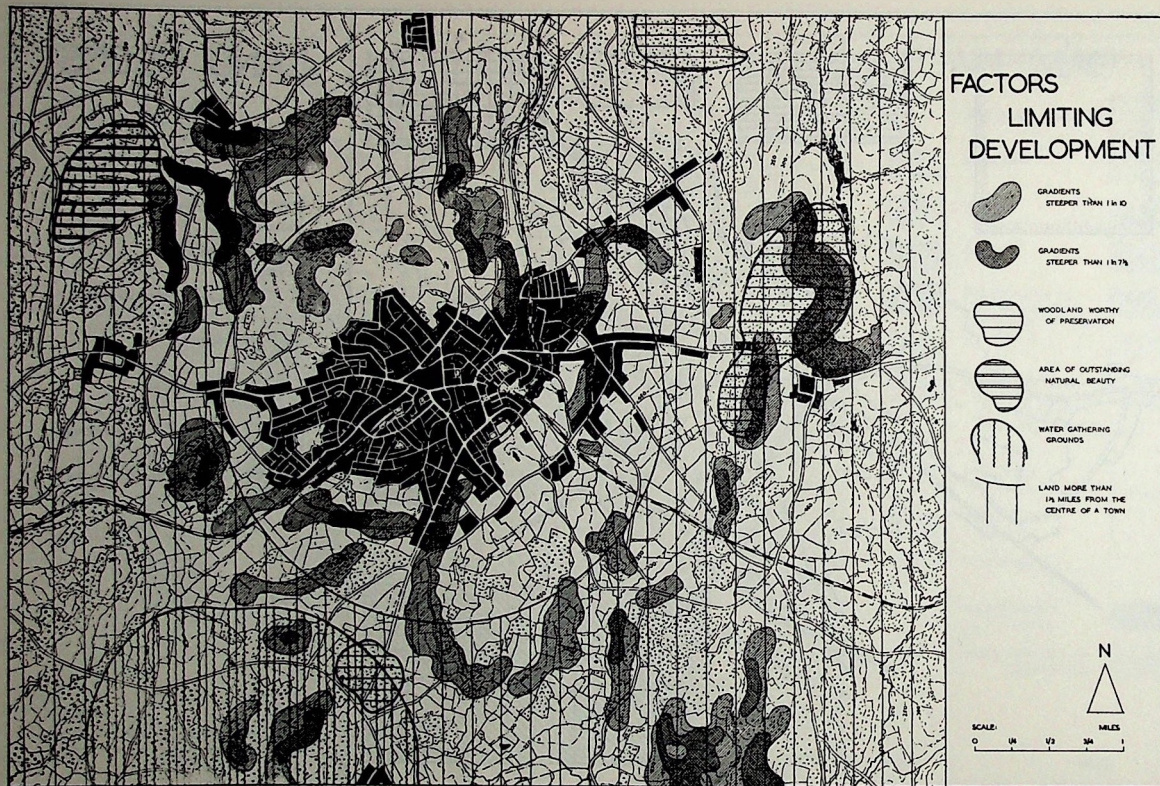


FIG. 29.

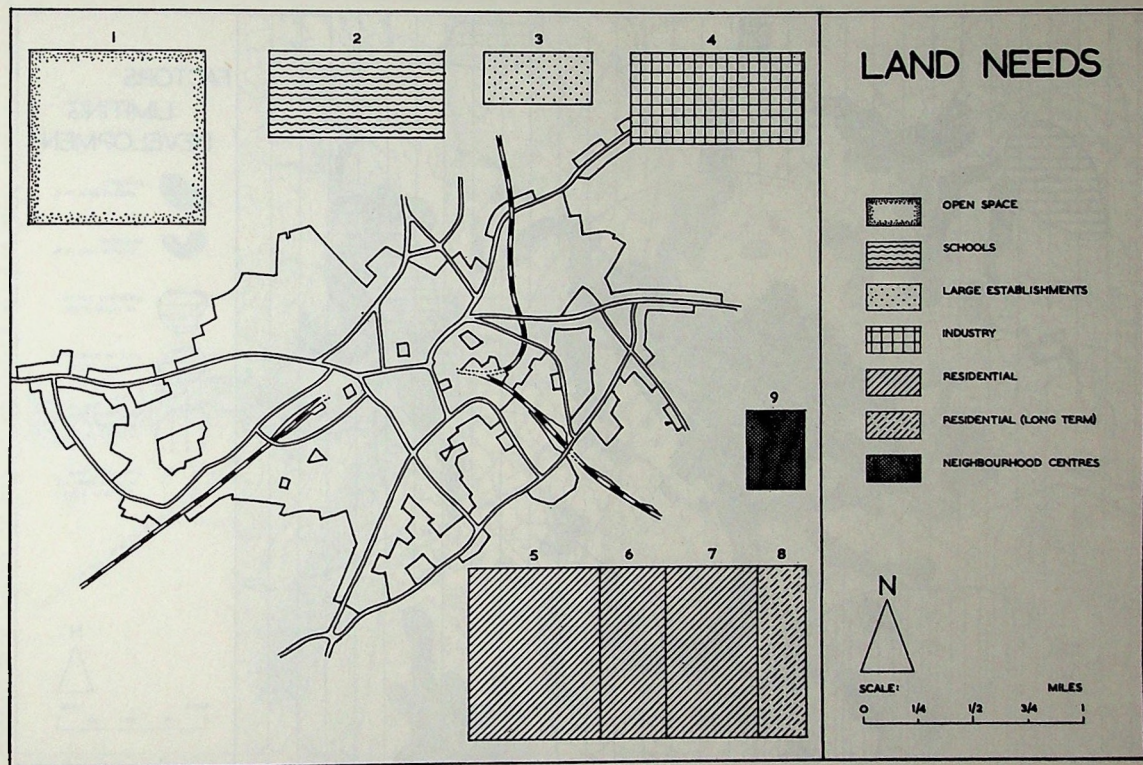


FIG. 30.

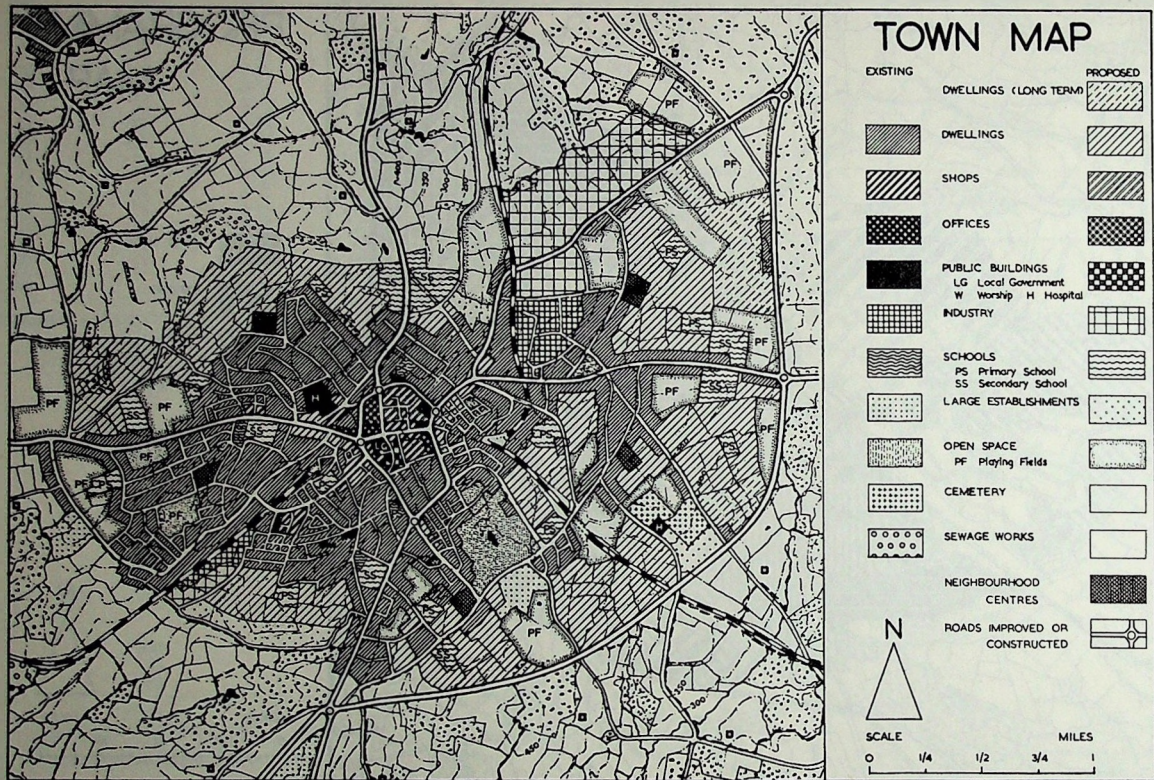


FIG. 31.

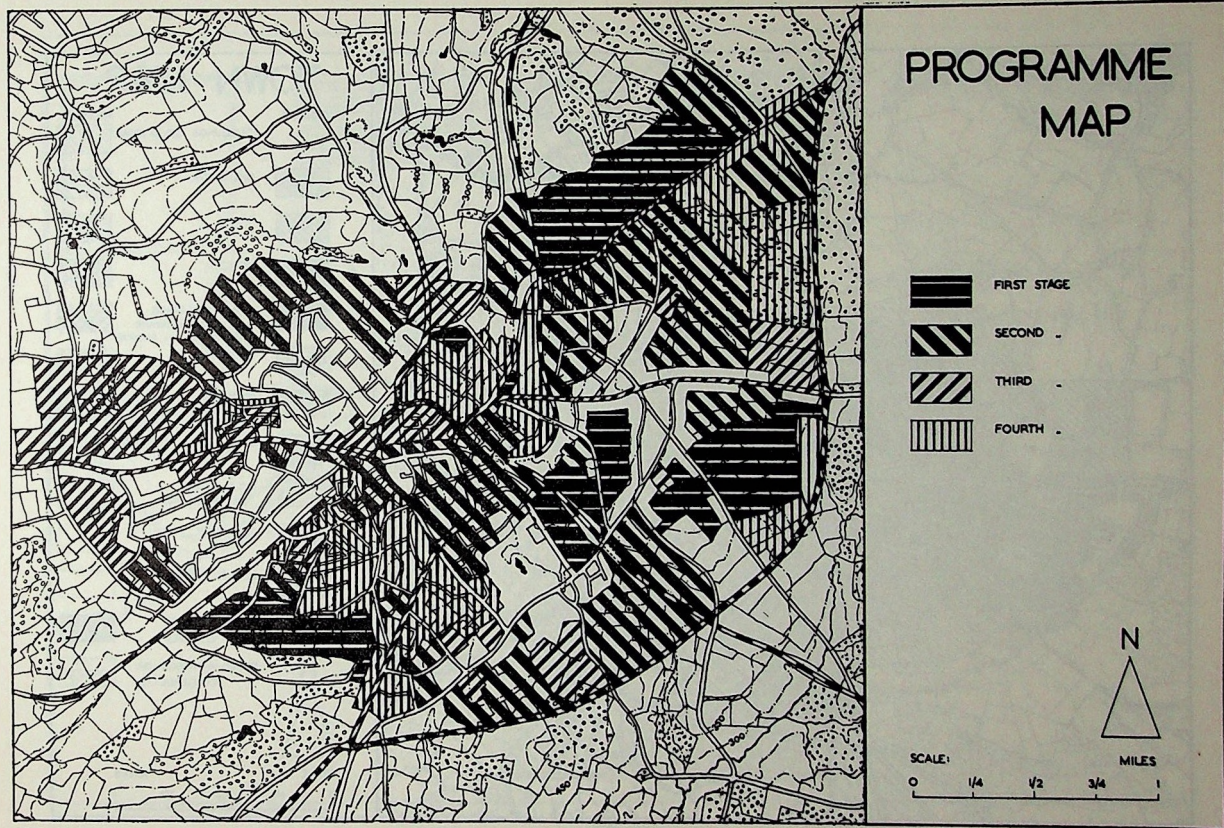


FIG. 32.

SUMMARY OF RESIDENTIAL DENSITY SURVEYS

| Cartogram No. | Acres | Acc. Dens. | O.R. | P.P.A. | Total Persons |
|---------------|--------------|------------|------|--------|---------------|
| 1 | 41 | 86 | 0.90 | 77.4 | 3,173 |
| 2 | 64 | 29 | 0.81 | 24 | 1,525 |
| 3 | 200 | 34 | 0.75 | 32.50 | 5,100 |
| 4 | 12 | 62 | 0.88 | 54.56 | 655 |
| 5 | 28 | 141 | 1.1 | 155 | 4,340 |
| 6 | 12 | 26 | 0.64 | 16.64 | 200 |
| 7 | 34 | 23 | 0.60 | 13.80 | 469 |
| 8 | 136 | 28 | 0.71 | 19.88 | 2,704 |
| 9 | 35 | 31 | 0.73 | 22.63 | 792 |
| 10 | 45 | 105 | 0.84 | 88.20 | 5,654 |
| 11 | 28 | 126 | 1.20 | 151 | 4,241 |
| 12 | 18 | 37 | 0.75 | 27.75 | 500 |
| 13 | 41 | 77 | 0.80 | 61.60 | 2,526 |
| 14 | 11 | 39 | 0.72 | 28.08 | 309 |
| 15 | 107 | 74 | 0.79 | 58.46 | 6,255 |
| 16 | 119 | 79 | 0.87 | 68.73 | 8,179 |
| 17 | 62 | 67 | 0.83 | 55.60 | 3,447 |
| 18 | 202 | 51 | 0.81 | 41.31 | 8,344 |
| TOTAL | 1,195 | | | | 58,423 |

LAND REQUIREMENTS FOR OVERSPILL REVEALED BY RESIDENTIAL DENSITY SURVEYS

| Cartogram No. | Persons in Excess of 0.8 O.R. | Rooms in Excess of 50 H.R.P.A. |
|---------------|-------------------------------|--------------------------------|
| 1 | 353 | 1,476 |
| 2 | 19 | — |
| 3 | — | — |
| 4 | 60 | 144 |
| 5 | 1,183 | 2,548 |
| 6 | — | — |
| 7 | — | — |
| 8 | — | — |
| 9 | — | — |
| 10 | 189 | 2,475 |
| 11 | 1,411 | 2,128 |
| 12 | — | — |
| 13 | — | 1,107 |
| 14 | — | — |
| 15 | — | 2,568 |
| 16 | 659 | 3,451 |
| 17 | 124 | 1,054 |
| 18 | 103 | 202 |
| TOTAL | 4,101 | 17,153 |
| | At 40 P.P.A. = 102.5 Acres | At 50 H.R.P.A. = 343 Acres |

SPACE STANDARDS FOR TOWN MAP

| | | | | |
|---|-----|-----|-----|---------------------------------|
| Accommodation Density | ... | ... | ... | 50 H.R.P.A. |
| Occupancy Rate | ... | ... | ... | 0.8 |
| Playing Fields | ... | ... | ... | 6 Acres per 1,000 people |
| Parks | ... | ... | ... | 1 Acre per 1,000 people |
| Schools | ... | ... | ... | Ministry of Education Standards |
| Large Establishments | ... | ... | ... | 2 Acres per 1,000 people |
| Neighbourhood Centres, Sub-centres, etc. | ... | ... | ... | 12 Acres per 10,000 people |
| Industry: 20% of total population in industrial employment, accommodated at 50 workers per gross industrial acre. | ... | ... | ... | |

The remaining survey maps are much as described in Chapter 8. It will be noticed that condition of non-residential buildings is assessed in relation to structural condition only. This is done because so many of them are so bad structurally that this is the predominant factor.

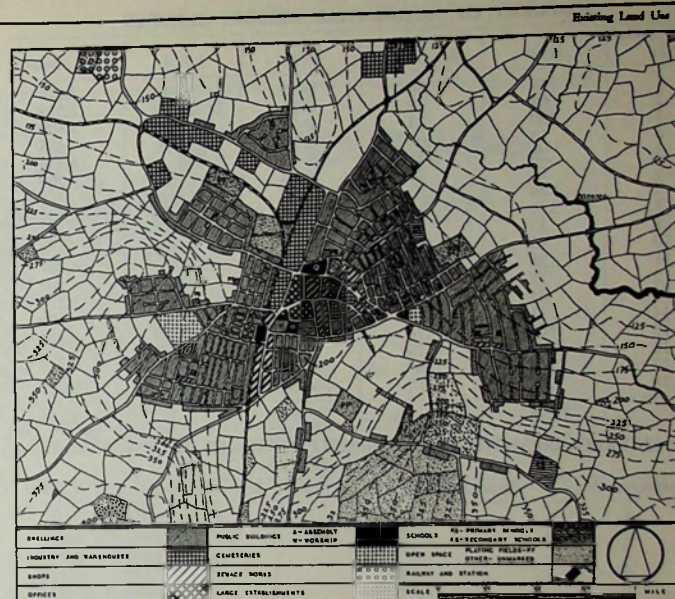
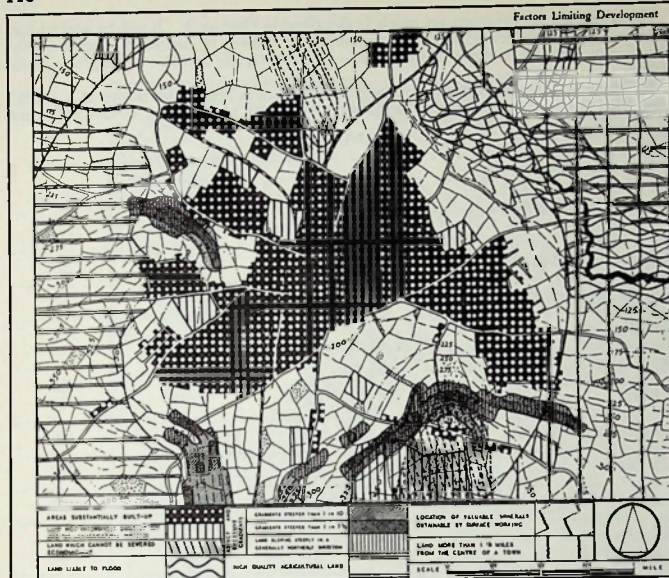
The sieve map showing factors limiting development is necessarily shown at a smaller scale than the remainder in order to include a wide area of search for developable land.

LAND USE

| Use | Existing | Additional needed to fulfil standards | Total |
|--|---------------------------|---------------------------------------|--------------|
| | Acres | Acres | Acres |
| Railways and Main Roads | 181 | — | 181 |
| Central Area and Public Uses | 95 | — | 95 |
| Cemetery | 28 | — | 28 |
| Open Space: Playing Fields Parks | 28 64 | 394 6* | 422 70 |
| Large Establishments | 67 | 73 | 140 |
| Schools | 9 | 211 | 220 |
| Industry | 61 | 219 | 280 |
| Neighbourhood Centres and Sub-centres | 19 | 66 | 85 |
| Residential: New Population Reduction of Occupancy Rate to 0.8 Reduction of Accommodation Density to 50 H.R.P.A. ... Less saving on redevelopment of old low density housing ... | 1,195 ... 343 20 | 300 102 | |
| Add residential land lost by change of use ... | 25 | | |
| 1st. 20 years (\$) ... Ultimately (\$) ... | 348 | | |
| TOTAL | 1,747 | 1,719 | 3,466 |

*Very much more than this is provided

The PROGRAMME MAP is divided into four stages and indicates the order both of development and redevelopment. As explained in Chapter 9, a Programme Map ought to show both programming and the land uses involved, but this is hardly possible with black and white presentation. Very rapid implementation of the Town Plan is envisaged, since, as will be seen, the new development to take place in the fourth stage consists principally of that shown on the Town Map to take place after 20 years, the first three stages being virtually completed during the first 20 years.



Traffic Flow.

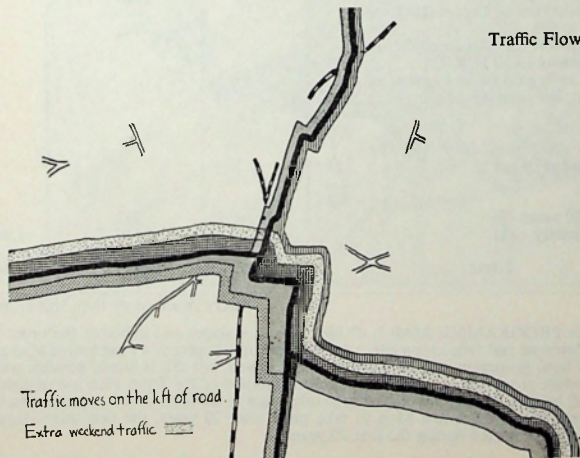


Fig. 33. This is another example showing a Town Plan and some of the principal surveys on which it is based. The maps are placed so that they can be seen together and easily compared. This illustration shows a more conservative Plan than that for the town in Figs. 24-32. One of the main differences is that it is here deemed necessary to arrange for the progressive decrease of occupancy rates, which, it will be seen, considerably complicates the calculations needed.

The town has at present a population of 47,000, which the Regional Plan proposes should increase to 50,000. There is a good deal of industry, some of it on very congested sites, but the town derives much of its importance from the administrative and commercial functions which it performs.

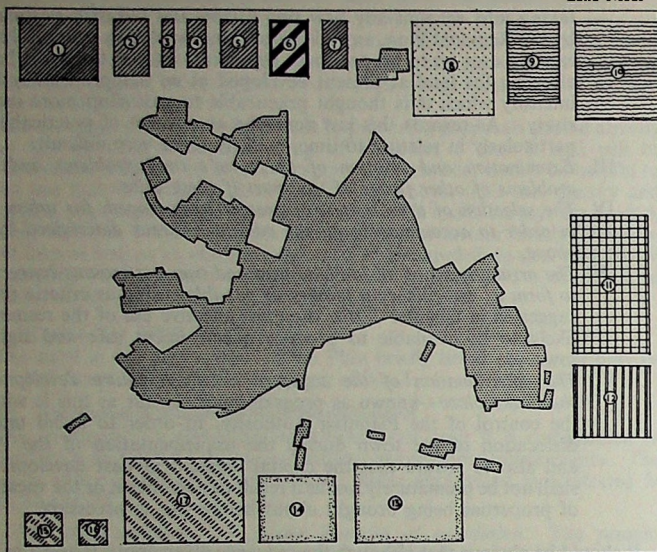
There are valuable minerals in the river valley to the east of the town, working of which is shortly to be begun.

The golf course to the south of the town is in parkland open to the public, so that no very large amount of new public open space other than playing fields need be provided.

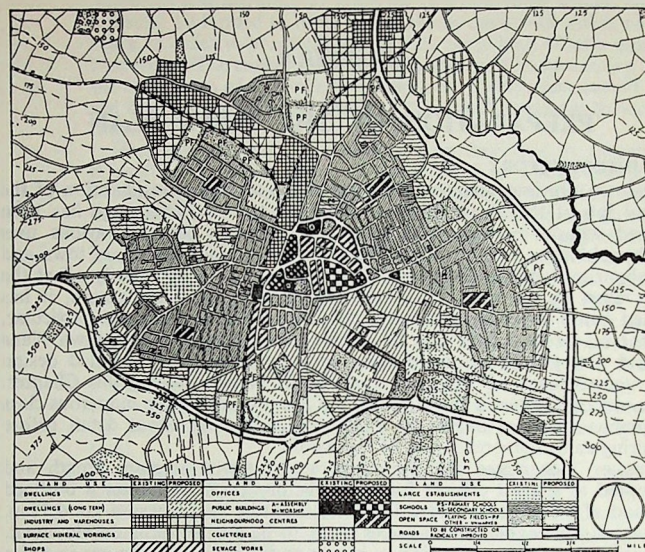
The traffic flow diagram shows the generalised results of an origin and destination survey. It gives only data relating to through traffic, there being no special aspects of importance concerning the distribution of stopping traffic.

It will be noticed that the space standards used are not identical with those in Fig. 31. In particular the standards for schools are more liberal than those now current.

Land Needs



Town Map



Existing land uses are as follows :—

| | Acre |
|---|--------------|
| IN CENTRAL AREA: | |
| Shops ... | 36 |
| Offices ... | 19 |
| Public Buildings ... | 9 |
| Industry and Wholesale Warehouses ... | 9 |
| Open Space ... | 9 |
| Dwellings ... | 15 |
| Total of Central Area ... | 97 |
| ELSEWHERE : | |
| Industry and Wholesale Warehouses ... | 115 |
| Dwellings ... | 682 |
| Open Space : Playing-fields ... | 44 |
| Other ... | 11 |
| Golf Course (part only shown) ... | 200 |
| Schools : Primary ... | 4 |
| Secondary ... | 18 |
| Large Establishments | 22 |
| Shops ... | 31 |
| Public Buildings ... | 30 |
| Allotments ... | 7 |
| Cemeteries ... | 19 |
| Sewage Works (part only shown) ... | 22 |
| Total of all non-agricultural uses ... | 1,355 |

Land required to implement the proposals of the Town Map.
(Numbers correspond with Land Needs diagram).

| | Acre |
|--|------------|
| REQUIREMENTS DURING FIRST 20 YEARS : | |
| 1. Increase of population by 3,000 at 40 persons per acre | 75 |
| 2. Overspill of 1,800 rooms from the worst areas of existing housing, occupying 25.7 acres with an average accommodation density of 120 habitable rooms per acre, to be redeveloped at 50 habitable rooms per acre ... | 36 |
| Less allowance for more intense development of old housing, 8 acres in extent, at present at a density of 12 habitable rooms per acre and to be redeveloped at 50 habitable rooms per acre ... | 6 |
| 3. Overspill from 1,200 rooms occupying 11 acres, with an average occupancy rate of 1.6, which is to be reduced to 1.3 ... | 30 |
| Less 50 habitable rooms added by conversion of houses into flats ... | 9 |
| 4. Nursery Schools* ... | 1 |
| 5. Service Industry at 6 acres per 10,000 population* ... | 8 |
| 6. New Neighbourhood Centre plus allowance for houses displaced by redevelopment in Central Area and by creation of neighbourhood centres in areas already built up ... | 15 |
| 7. Sites for neighbourhood sub-centres and isolated public buildings* ... | 30 |
| Total residential and ancillary requirements for first 20 years ... | 213 |
| 8. Large establishments at 3 acres per 1,000 people ... | 150 |
| Less existing ... | 31 |
| Total long-term requirements ... | 119 |
| C./f. 332 | |

| | Acre | B./f. 332 |
|---|------------|-----------|
| 9. Schools : Primary ... | 75 | |
| Less existing ... | 4 | |
| 10. Secondary ... | 158 | 71 |
| Less existing ... | 18 | |
| 11. Industry and Warehouses ... | 280 | 140 |
| Less existing to be retained ... | 115 | |
| 12. Area for extraction and processing of minerals ... | 165 | 90 |
| 13. Playing-fields at 3½ acres per 1,000 people ... | 175 | |
| Less existing ... | 44 | |
| 14. Other open space ... | 90 | 141 |
| Less existing (other than Golf Course) ... | 11 | |
| Total 20-year requirements ... | 79 | |
| LONG-TERM REQUIREMENTS: | | |
| 15. Occupancy rates to be reduced from an average of 1.2 to 0.8 within an area of 30 acres with an average accommodation density of 60 habitable rooms per acre ... | 19 | |
| 16. Occupancy rates to be reduced from an average of 1.0 to 0.8 within an area of 40 acres, with an average accommodation density of 50 habitable rooms per acre ... | 10 | |
| 17. Overspill, at 50 habitable rooms per acre, arising from reduction to 50 habitable rooms per acre of 187 acres at present at an average of 90 habitable rooms per acre ... | 150 | |
| Total long-term requirements ... | 179 | |

*Not separately indicated on the Town Map.

CHAPTER 9

PREPARATION OF THE TOWN PLAN

9-1. INTRODUCTORY

The two previous chapters have paved the way for consideration of the central job of the Town Planner—Planning towns. This stage has been reached without consideration of space standards for the various uses which make up a town or of the requirements for road layout, of town and neighbourhood centre design and so on, all of which necessarily affect the form taken by the town Plan. As explained in the Introduction, it has seemed better to proceed consistently from the general to the particular, but the reader who feels that he cannot think properly about town Plans without first getting his mind clear about standards and detailed design is invited to break off here and read Part II before tackling this Chapter. The order of chapters is for the benefit of the probably more numerous class of persons who feel unable to understand argument about detail before acquiring some comprehension of the whole.

Chapter 7 examined the characteristics of towns at some length and attempted to suggest criteria for a satisfactory town. Chapter 8 outlined the kind of information which is needed in order to prepare a good Plan, one which will enable the resources likely to be available for development, redevelopment and preservation to be put to the most effective use in order to produce a convenient, safe and rightly town.

We now have to discuss the actual methods by which this may be done.

It will be well to emphasise here that from many points of view the designing of a new town is a very much easier process than the preparation of a Plan for the reshaping of an existing town. In the former case the siting of land uses and the design of the road system is relatively unhindered by existing conditions, and, if the town is genuinely to be a new one, the correction of past errors, which is so important a part of the replanning of existing towns, is hardly involved.

The peculiar problems of most new towns are the creation of a special visual character, the fostering of social cohesion and the correct deployment of capital rather than those of actual Town Planning, so that further separate consideration does not appear to be necessary.

The process of preparing a Town Plan may be divided into the following stages:—

- I. *Determination of space standards for all uses.* This will not be considered in this Chapter since it is fully dealt with in Chapters 11 to 16. It may be said here that the more this can be a technical rather than a political process the better the results likely to be obtained.

- II. *Determination of the Total Amount of Land Required for the Town*, taking into account any new population and industry postulated by the Regional Plan, any additional land needed in order to bring existing uses up to proper space standards, and on the other hand allowing for land at present developed at an inappropriately low intensity which it is thought practicable to redevelop more intensively. As regards this last item, the assessment of practicability, particularly in relation to time, is likely to be very difficult.
- III. *Examination and solution of the town's road problems and the problems of other forms of transport if these arise.*
- IV. *The selection of actual sites, at present undeveloped, for urban use in order to accommodate all the additional areas determined by II above.*
- V. *The arrangement of all the land uses and transport routes concerned to form as satisfactory a totality as possible*, using as criteria those suggested in Chapter 7, viz. the most effective use of the resources likely to be available to produce a convenient safe and sightly town.
- VI. *The determination of the sequence in which future development shall take place*—known as programming—so far as this is within the control of the Planning Authority, in order to avoid undue dislocation of the town during the implementation of the Plan and also to ensure that the capital invested in past development shall not be prematurely lost as a result of demolition or the vacation of properties being brought about before this is necessary.

It should be obvious that although the sequence given above is appropriate in general terms it is likely to be necessary constantly to examine the requirements under one head in the light of those under others, if the final result is to be the best possible.

It would be foolish to determine space standards for a particular town according to some theoretical system if the local topography, the nearness of other towns or the social habits prevalent in that town made it clear that some departures from theoretical norms would be desirable. The town's road problems cannot be finally solved without reference to the actual location and extent of the sites to be used for future development, since the character and availability of land in particular situations is bound to affect the routing of any new main roads considered desirable. Again, the choice of land for future development must often be substantially affected by the existing pattern of development; it would be highly inappropriate to select land for development in only one quadrant of the town because of its special physical suitability for development, if, in fact, in other quadrants there were incomplete neighbourhoods requiring expansion for their proper functioning. Clearly, therefore, III cannot be considered except in relation to IV, IV cannot be considered except in relation to V, while V cannot be considered except in relation to VI. These are obvious links between the different headings; there are many others.

In the majority of cases, nevertheless, the solution of road problems is

likely to be the principal determinant of the form which the plan takes, for in very many towns it is the existing road system which is the most seriously defective part of the town, and which poses the most severe problems for its solution. Very often the solution cannot be obtained without accepting some distortions of other aspects of the Plan which ideally would be considered undesirable.

The use made of survey information in preparing proposals should already have become clear from a reading of Chapters 5 and 8, and will be further explained later on in this Chapter. Meanwhile, it may be helpful to point out that, in order to deal with No. II above, land use, density and condition surveys are needed, to deal with No. III traffic surveys are needed, to deal with No. IV all the factors comprised in a factors limiting development map as well as an existing land use map are needed, to deal with No. V the existing land use map is needed, to deal with No. VI a condition of building survey is needed.

9-2. STAGES OF PREPARATION

The steps in the preparation of the Plan briefly listed above will now be more fully discussed, with the exception of No. I.

(II). The amount of land needed for future development

This is basically a straightforward calculation, but it is complicated in several ways by the need to make assumptions regarding future events. The steps in this calculation are as follows; their application is illustrated in Figs. 30 and 33.

- (1) *Accommodation for future increase of population.* The present population of the town deducted from its intended future population—assuming that some increase is being planned for—gives the population for which no accommodation, even inadequate, already exists. The net residential density, in habitable rooms per acre, at which these people are to be housed should have been decided. It is best to decide an average net residential density for the town as a whole, leaving any substantial areas of exceptionally high or low density to be dealt with as special cases; they will not greatly affect the town's total space requirements.

The average occupancy rate must also be fixed; this may vary considerably, according to the general economic level of the town's citizens but a reasonable general figure might be 0.8, e.g., four persons to a five-room house. The intended increase of population divided by the net residential density and by the occupancy rate gives the total area required for *housing* for these people.

- (2) *Accommodation for buildings displaced on redevelopment of areas built up too densely.* The redevelopment of excessively densely built areas entails that the same number of habitable rooms cannot be replaced on the site, the remainder, colloquially known as "overspill," must be put elsewhere.

The problem here is to decide which areas are to be regarded as possible subjects for redevelopment within a reasonable time.

Although consideration of areas for redevelopment should not, in my view, be limited to those which can be dealt with within twenty years, in order to produce a useful Plan some kind of limit must be observed. The redevelopment of soundly built houses dating from the early years of the present century is so remote that, even if they are built at an excessive density, it is hardly realistic to include them.

Here the condition of buildings map described in Chapter 8 is useful. It enables areas to be selected in which, because of excessive density, unhealthiness, bad structural condition, lack of daylight and so on, standards are below not merely the ideal, but the civilised, and redevelopment must be regarded as urgent, even if it cannot, so far as can be seen at present, be carried out within twenty years. When these areas have been selected it is simple to calculate from the accommodation density survey how many habitable rooms can be replaced on the site at the average net residential density which has been decided upon and how many acres are required to rebuild the rest elsewhere at that density. From this number should be deducted the number of extra habitable rooms which could be built on the redevelopment of areas of old low-density housing if these amount to a significantly large total.

Note that persons do not come into these calculations, which deal entirely with building accommodation.

- (3) *Accommodation for persons living at an excessive occupancy rate.* From the Population Density Survey, the number of people who must be provided with other accommodation to reduce occupancy rates to whatever figure is decided upon as the temporarily acceptable maximum, can be found. In dealing with the reduction of excessive occupancy rates there is less question of deciding upon degrees of urgency, since the relief of over-occupancy is a matter of building new dwellings only, not of demolition plus new building.

From the total obtained should be deducted the approximate additional number of people who could be accommodated in areas with exceptionally low occupancy rates if they were to be more fully utilised. This is difficult to determine. Such areas consist usually of large Victorian houses, no longer attractive as single family residences to the kind of people who can afford them, and suitable for conversion into flats. The need for additional kitchens, bathrooms and lavatories means that, when converted, there will not be as many habitable rooms as previously, though this may be offset by the possibility of dividing some large rooms into two. Three-quarters of the number of existing habitable rooms might be a reasonable proportion to take. This calculation should not be made unless there are enough such houses to make a real difference to the final figures of space requirements.

The acreage required to house the overspill of people can then be calculated in the same way as for additional population, as des-

scribed in (1) above. *Note that this calculation refers to redistribution of persons, not of buildings.*

- (4) *Total area required for new housing and other new uses.* The areas found from 1, 2 and 3 make up the total area of land required for new housing required to accommodate any intended increase of population and to bring about reasonably decent living conditions in the whole town. It is now necessary to determine the total area required for the intended population of the town for public buildings, shops, industry, open spaces, and other non-residential uses, in accordance with whatever standards have been adopted. The existing area devoted to these uses is deducted, making due allowance for "overspill" from existing non-residential development at excessive intensity, from the total needed, and the difference between the two figures is the additional area required for non-residential uses.

It is just possible, though very complicated, to base the calculations of new residential land required upon gross neighbourhood densities rather than net residential densities; indeed, at first sight it seems simpler to do so, but the reader who does not care to take my word for it is invited to try some calculations for himself. In trying to decide how much new residential land can be served by existing neighbourhood facilities and how much requires to be developed in the form of new neighbourhoods he is pretty sure to land himself in a remarkably tangled arithmetical thicket.

- (5) *Calculation of long-term requirements.* It is desirable to work out the additional land required for the redevelopment of dense residential areas with a long life and to reduce occupancy rates further from the barely healthy to the satisfactory. However long it may be before this can come about it is necessary to calculate the amount of land involved so that it can be established that there is, in fact, sufficient physically suitable land adjacent to the town for this final step to be carried out. If there is not, it will be desirable to consider slightly increasing average densities in order to leave space for these ultimate operations. There is no need to estimate land requirements for the non-residential neighbourhood uses to be associated with this long-term redevelopment, for the total land requirements for the whole population of the town have already been taken into account at (4) above. This theoretical basis should prove satisfactory in practice, since the overspill from final redevelopment would, for many reasons, almost certainly be in the form of additions to existing neighbourhoods rather than new neighbourhoods.

It may not always be appropriate to divide the reduction of occupancy rates into two stages, since it may well be considered feasible to reduce all excessive occupancy to a satisfactory rather than a merely tolerable level during the main period of the Plan, but the splitting of accommodation density reduction into two stages will almost invariably be necessary if the Plan is to be realistic.

It will be well to emphasise once more that Planning cannot be an exact science. One cannot Plan for shopping and open space facilities with precision, so that their quantity is "right." To take shops, as an example, if a group of shops earns a bare living from a service area with 1,000 population, that population may be capable of rising to 5,000 before the existing shopping facilities become seriously inadequate. Planning to standards is an attempt to ensure something near the optimum provision of all uses but considerable flexibility is inevitable and, fortunately, without serious effects. It is for this reason that in (2) and (3) above it was suggested that adjustments to calculations should not be made unless they would result in considerable modification of the total figure of space requirements.

Page 117 gives an example of the calculations required to determine total space requirements for a development plan for a medium-sized town.

Fig. 31 shows the essential features of the Town Map which might be prepared subsequently from these, and Fig. 33 also illustrates the process.

A further warning is necessary if this section is to be fully understood. The processes of decanting surplus accommodation and surplus people from densely developed and densely occupied areas, although *described* separately, in fact, of course, proceed simultaneously. Most, though not all, areas with an excessive occupancy rate also have an excessive density of habitable rooms and, if such an area is redeveloped, new accommodation has to be found at the same time for the people whose accommodation cannot be replaced on the site and for the people who must be housed elsewhere in order to secure satisfactory occupancy rates in the new houses built. Failure to distinguish between these two statistically distinct processes results in hopeless confusion.

Further, the mathematical approach to the problem required for the purpose of estimating space requirements, and the use of the convenient but somewhat repulsive terms "overspill" and "decanting" should not prejudice the reader towards acceptance of the view which enemies of Planning are fond of putting forward, that land Planning involves an inhuman and impersonal treatment of the people involved. To try to estimate your land requirements sensibly in no way prevents the people necessarily displaced from receiving the most sympathetic treatment and the utmost consideration in being found acceptable new homes. Indeed, much of the process, particularly in the later stages, is likely to be voluntary and so gradual that no one will be conscious of pressure being exercised by Planning control; it may well come to the eventual demolition and redevelopment of houses in which, for some time, no one has lived or been willing to live.

One additional common source of misunderstanding had better be cleared up. It is, of course, true, that you cannot solve the overcrowding problems of individual families by building more houses, leaving all parents in their old homes and sending all their children of whatever age, to a new Housing Estate in order to reduce occupancy rates! The whole process of clearance, redevelopment and resettlement is a complicated problem of Estate Management. Nevertheless the method which has been described produces correct quantitative results. It does no more and no less than to indicate the amount

of elbow room needed to solve the various problems of residential overcrowding.

(III). The solution of road problems

This is a very involved matter. Just as with the formulation of regional road proposals so with the town. It is easy enough to draw lines on paper which will constitute a complete solution of the problems if you are prepared to build enough new roads and enough complicated road intersections, but a useful set of road proposals must take account of the amount of money likely to be available for road construction and also for the acquisition and demolition of buildings which obstruct road improvements.

In the absence of detailed long-term estimates for the allocation of funds for road works this can only be a matter of guesswork. Proposals should be formulated with a view to producing the best possible results for an assumed maximum expenditure. If adequate traffic surveys have been carried out they will provide the basis for the road plan which, important though it is, must, as already indicated, be worked out in conjunction with other aspects of the Plan and pay due regard to them.

It is very difficult to suggest general principles, but one may perhaps distinguish between two distinct problems. Very often the total amount of traffic passing through a town is so excessive for the capacity of the existing roads that serious traffic blocks frequently occur. This can often be solved by a by-pass or a complete or partial outer ring road. The cost of these can be calculated with some precision, and routes chosen and kept clear for ultimate construction however remote they may be. Similarly, traffic within the town may create very serious local congestion, particularly in and near the town centre. Here again a complete or partial inner ring road can be planned for, and may be the means of resolving the difficulty. But even when there is no acute problem, almost every main road within almost every town is, to some extent, unsatisfactory and dangerous because of intersections by minor roads, property accesses and insufficient segregation of pedestrians. In most cases the general line of such a road is satisfactory, subject possibly to minor straightenings, but its improvement to the extent of forming a proper track for motor vehicles is likely to be so costly, involving as it does the demolition of buildings on both sides and the stopping up of innumerable accesses, and there are so many of these roads in existence that improvement is likely to be exceedingly remote in time. It is probably best to ignore such roads in the Town Plan and to assume (and state this in the written part of the Plan) that they will automatically be improved when the general redevelopment of the land on either side of them takes place; when this happens the improvement need be neither difficult nor costly.

(IV) Selection of land

Once it is known roughly how much land is required for the development Plan, the actual land to be used can be selected, and here the sieve map described in Chapter 8 is invaluable. The best method is to select all the land which, by reason of position in relation to existing development, configuration, sewerability, and so on, is reasonably suitable for housing development,

the physical requirements for which are less stringent than for most other uses, except parks, to divide this land into units whose boundaries are well defined and to measure the area of each.

It will probably be found that the total land first chosen as suitable will not be sufficient to meet all requirements; further selection should be made from the least unsuitable land remaining until the necessary total is reached. The Planner will then have a defined area within which to accommodate his design.

It may be desirable to select further "Second XI" land as a reserve which, although there are disadvantages attaching to its development, may on balance be found preferable, because of its position, to some of the "first XI" land when the Plan comes to be worked out in detail.

At this stage the economic implications of the choice of land should initially be considered. Is it better to take this area of flat, well-drained fertile land for housing, which can be developed cheaply, rather than a comparable area of steep, broken, heavy clay agriculturally of small value but costly to develop for housing? Will the cost of pumping sewage from this low-lying land, if it is developed, be greater, all told, than the cost of the new length of road required to obtain access to other land suitably located for sewerage by gravity?

The extent to which these considerations affect the final form of the Plan depends very much, of course, upon whether the Planning Authority concerned is also a Developing Authority or whether, as in the case of a County Council, it stands comparatively aloof. It depends too, on any arrangements which may be made for encouraging the development of comparatively expensive land by means of differential subsidy or otherwise in order to conserve the more valuable agricultural land. Such arrangements are at present unfortunately lacking in this country.

At all events it is safe to say that these considerations ought to be actively in the mind of the Planner when he first draws up the Plan, however much they may suffer damage in subsequent consideration. Despite Dr. Lichfield's invaluable work we still have no adequate means of comparing the value of development with high visual and other amenity at correspondingly high financial cost as compared with other less attractive development at lower financial cost, but the limitations of the method do not impair its essential worth.

(V) Designing the Plan

Not very much can be said about this. Clearly it is necessary to design with the various principles already suggested clearly and constantly in mind, but no one can tell a Planner, or any creative designer, how to produce good work; it is a matter of innate skill, training, experience and industry. It may, however, be said that it is a good idea, as in most affairs, to proceed from the general to the particular and thus to concentrate upon producing a Plan which is satisfactory in broad essentials before tackling any details of design in any part of it. At this stage it will be necessary to prepare numerous rough drafts from which the most satisfactory is finally selected.

There are two main methods of working, and it will depend entirely upon the temperament of the Planner which of them is adopted. One is the

intuitive, which involves a great deal of doodling without much conscious effort until something promising springs to life; the other is the analytical, where the designer seeks to tabulate mentally and on paper the existing and potential qualities of the site, and postpone the subconscious leap from thinking about the design to actually making it until he has amassed all the information he wants. It is also possible to combine the two methods in any proportion.

If the analytical method be used (obviously one cannot say anything more about the intuitive method) it may be helpful to note on a plan, in order of suitability, all the possible uses for each area to be developed and, by studying these notes, to seek a combination into which each use fits harmoniously in relation to existing and other proposed uses. This could be carried further by making lists of some of the more promising combinations of uses, and drawing these in sketch form.

One point is of special importance in the case of a large town. If there is a fairly wide choice of land for new housing its selection should be largely based upon a study of the journey to work map to enable workers living in areas to be redeveloped at lower densities to be rehoused where they will be reasonably close to their work.

Great care must be paid to agricultural considerations. Although the Plan will eventually be scrutinised by the Ministry of Agriculture it is important to avoid doing work which is likely to be rendered abortive by valid agricultural objections. Not only, other things being equal, should areas of generally low agricultural value be selected for development rather than those of high value, where there is a marked difference within the potential development area, but the minimum disturbance of farm units should be aimed at. Generally speaking, it is better to annihilate four units than to maim ten.

When the main features of the Plan have been settled it is desirable to calculate the gross density of each neighbourhood unit or comparable subdivision of the town so that a measure is obtained of the scale of local services necessary in each.

One of the most difficult problems is to decide the practicability of changing the use of existing developed areas within a period short enough to be Planned for. The misplaced large factory and the two-mile-long shopping street are typical examples of uses which it may be eminently desirable to change, in the first case by removal, in the second by breaking the continuity of shopping frontage and substituting shopping centres at intervals with subsidiary groups of shops on back land (see Fig. 34 (v)). But they are likely to be so firmly rooted and to represent so large an amount of invested capital with great residual earning power that it may be unrealistic to contemplate changes.

Each case must be considered on its merits; where it is decided that change is impracticable the Plan as a whole must obviously be modified from the ideal so as to make the best of a bad job; where change is decided to be possible the future uses of the areas to be changed must be decided upon, and the Plan designed in such a way that things will work reasonably well in the period before the change takes place as well as afterwards. It is no good making a plan in such a way that after the removal of a factory everything

will go smoothly, but during the intervening twenty or thirty years there will be severe local confusion and inconvenience.

This is a matter of the greatest importance, for the uncertainty of implementing Planning proposals makes it essential that each interim stage of development and redevelopment envisages an acceptable state of affairs.

Rather similar considerations apply to certain unbuilt-on land so sited that it would produce a better Plan if part at least, were devoted to housing or some other building use, and other land better located in relation to the residential areas of the town generally, put to open space use. Very often local pride, the historical associations of a particular open space or sheer conservatism may conspire to render such proposals impracticable.

A striking example of such land is Wythenshawe Park, which virtually splits in two Manchester's satellite town, providing locally enormous areas of open space, while the remoter residential neighbourhoods have no adequate public open space near at hand. All land Planning considerations would dictate the use of part of Wythenshawe Park for housing, but I find it difficult to think that anyone has ever regarded this as a practical proposition.

The large area of allotments serving as grouped garden space for an area of dense nineteenth century housing is a slightly less hopeless case. In my view, allotments are only needed where garden space is inadequate or wrongly distributed, as will be further explained in Chapter 16, so that when redevelopment of the housing served by such allotments takes place it ought to be possible to devote the allotments to some other use. Even here resistance is liable to be great, apart from the fact that at present the Ministry of Agriculture has to be consulted where it is proposed to convert allotments to some other purpose. Allotmenters are a vociferous class likely to exert substantial local influence against such conversion.

(VI) Programming

When dealing with the programming of the Town Plan one does not of course, as in the case of the Regional Plan, have to take mobility of labour into account.

The prime consideration is the preservation of compactness, so that, if growth is unexpectedly halted, temporarily or permanently, the town will, nevertheless, be a balanced unity. This principle is modified, however, by two considerations: Industrial growth, in a really large town, must be accompanied by residential growth in convenient relationship to it and residential development, where it is in the form of neighbourhood units, must be so arranged that there is no danger of a halt to growth resulting in several neighbourhoods being left incomplete, and consequently unable to support neighbourhood services. This consideration must often prevent outward growth taking place evenly in all directions. (See Fig. 34 (i) and (ii).)

In normal circumstances it is clear that, to ensure that orderly growth provides a satisfactory balance at all stages, residential development should proceed in the following order:

- (i) Development of sites within the built-up area.
- (ii) Completion of neighbourhoods already partially developed.
- (iii) Creation of new neighbourhoods.

In a good many towns, where no substantial growth is contemplated and no large amount of early redevelopment feasible, there are so many vacant sites within the built-up area that no development of new areas ought to be contemplated until they have been filled in.

Two factors have so far regrettably prevented this desirable policy from being completely carried out. Since the majority of post-war housing has been carried out by local authorities and since the stigma attached to "council houses" still exists, many local authorities have shrunk from filling in gaps in areas of private enterprise housing. Some moderation may be advisable when trying experiments in social mixture, but timidity in this direction has often been carried to quite absurd lengths.

Consider Fig. 34 (iv). The area edged black represents an undeveloped area in a town already over-supplied with low-density housing, in which suitable peripheral land for housing is almost exhausted. The local authority has refrained from developing it solely on account of the character of adjoining low density housing, yet it seems in the highest degree improbable that there will ever be a demand for enough new low density houses in the whole town to fill it, and there are, in other parts of the town, numerous vacant plots, singly and in groups, within areas of low-density housing. Another factor which makes local authorities reluctant to develop small sites of half a dozen houses or so is the relative convenience and economy of administering a large site.

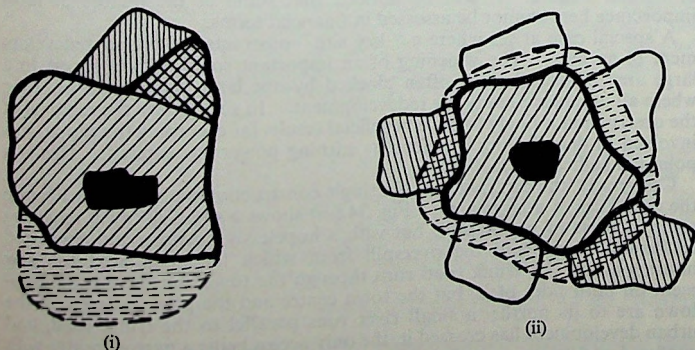
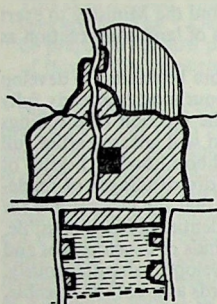
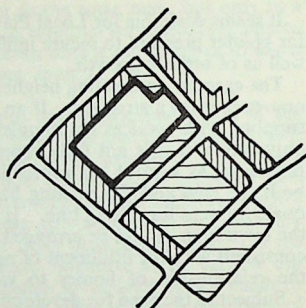


FIG. 34. Problems of programming and redevelopment.

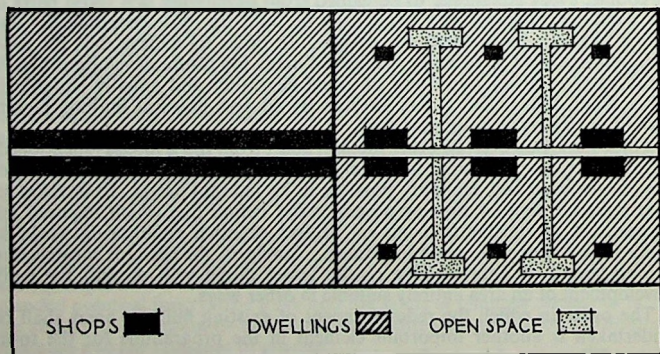
- (i) Existing town within black border. Industrial area cross-hatched. In order to secure concentric growth most of the new development ought to be at the bottom of the town but a proportion will have to be in the vertically hatched area at the top in order to relate work places and homes satisfactorily.
- (ii) For the reasons given in the text it is necessary for new development to be undertaken neighbourhood by neighbourhood rather than strictly concentrically as would be theoretically desirable in the interests of even growth.



(iii)



(iv)



(v)

- (iii) The construction of a new bridge is necessary if new development is to take place in the right location at the top rather than at the bottom, which will involve loss of good agricultural land and perpetuating the splitting of the town by the trunk road running across.
- (iv) Vertical hatching represents medium density housing, horizontal hatching represents low density housing. The black edged area is unbuilt on.
- (v) On the left is a typical shopping street serving in an imperfect way the residential areas behind it. It should be imagined to stretch for something like two miles or more. Assuming that it is either not desired or impracticable to remove shopping entirely from this road the next best alternative is to break its continuity by introducing open space in order to provide some differentiation and division of the urban mass and to introduce minor shopping centres on the back land. Unless the main road shopping frontage can be substantially reduced these sub-centres will not pay their way, or at least are unlikely to be established, but once established they will greatly increase the accessibility of shops to the residents concerned.

It seems desirable for Local Planning Authorities and the Ministry to exert far greater pressure to secure infilling in the interests of land conservation as well as of orderly growth.

The case for completing neighbourhood units before beginning to develop new ones is even stronger. If an incomplete neighbourhood is already fully supplied with services its completion will involve the erection of dwellings only, while, if it is not fully supplied, its completion will ensure earlier full provision, as against the probability, if a new neighbourhood is begun, of both the new and the existing having to suffer the disadvantages of inadequate services for a long time. It is, therefore, clear that the programme for the town Plan should be arranged so that as few residential areas as possible, consistent with the fulfilment of needs for different kinds of development and the relationship of homes to workplaces, are developed simultaneously.

Subject to the need for development to grow outwards as evenly as possible, for proper relationship between homes and work places to be maintained and for as few separate areas as possible to be developed simultaneously, there is, of course, every advantage to be gained from developing first those parts of the available building area which can be built up most economically and which offer the freest scope for design. In order to achieve this, the sieve map already used in selecting the actual areas for future development, is of great value. Given two areas of equal centrality and equally suitable in other ways, that which is less affected by adverse physical limiting factors should obviously be developed first.

There may, however, be other factors, apart from those already mentioned, which upset this; it would, for example, usually be necessary, irrespective of the convenience and economy possible in its internal design, to develop an area with satisfactory existing access routes before one which required the expenditure of substantial sums on bridges or other engineering works in order to secure proper communications. Similarly, the need for constructing a long length of unproductive outfall sewer might well prevent the early development of an area entirely suitable in other ways.

The order in which the redevelopment of existing built-up areas shall be undertaken is another important element in the programme for the town Plan. Where no change of use is involved the process merely involves the selection from the blight factors sieve map described in Chapter 8 of the areas in greatest need of redevelopment and providing for work to be done in order of need. Even in this simplest case, however, it will be necessary to take into account the relationship between the location of areas for redevelopment and new housing and of workplaces, so that as little upheaval and wasted travelling as possible may result.

Where the use of land is to be changed from residential after redevelopment great complications are likely to arise; the best order of redevelopment can only be decided after giving due weight to several factors not easily compared with each other. These factors are, briefly:

- (i) The continued detriment to residents in the most unsatisfactory dwellings if the order of redevelopment postpones the replacement of some of these until after that of less bad areas.

- (ii) The capital loss involved in replacing buildings before it becomes physically necessary to do so. This ought not to have to be taken into account, because no dwellings which are wholly unsatisfactory should be tolerated, but in circumstances which combine housing shortage with economic stringency it cannot be ignored.
- (iii) The various losses which are liable to arise from the postponement of provision of essential non-residential uses on suitable sites.

This is a problem which must be faced in preparing almost any programme. The difficulties involved may be illustrated by an example.

Consider the case of a town which urgently requires an inner ring road, the lack of which causes enormous loss of time through congestion and also great danger to life. The construction of the ring road will involve the demolition of some two hundred houses which lie on its route, but most of these are by no means of the very worst type, of which a dense mass unfortunately lies well clear of the route.

Who is to say which should come first; the ring road, which will increase the safety, the efficiency, and hence the prosperity of the whole town, or the clearance of the slum, which will relieve the wretchedness and, no doubt, prolong the lives of many who now live in it? The immediate appeal to human emotions of slum clearance projects is always likely to tip the balance in that direction, but, on a dispassionate assessment of all the facts, it may well be that the construction of the ring road constitutes the greater increase of human welfare. It will be noticed that some of the factors of most importance here cannot be assessed in financial terms.

A special case arises where a "key site" obstructs the proper redevelopment of an area. The widening of an important road or road access to a large area of back land is often blocked by one large, substantial building where all others are ready for redevelopment. In such a case the removal of the obstruction is likely to have beneficial results far exceeding the capital loss involved in demolishing it before its earning power has expired. This is a point not sufficiently realised.

Conversely, the carrying out of a single constructional project may liberate the capacities of a large area. Fig. 34 (iii) shows a smallish town, requiring some increase of population, but with a hopelessly outworn and congested residential core, from the overspill from which the main need for new housing arises. A trunk road runs through the town and there is development on both sides of it, but the town centre and the great majority of the town are to its north; a small river runs parallel to the trunk road, and urban development has crossed it, the only access being a narrow bridge with confused and narrow approach roads. The land to the north of the trunk road is of very poor quality, while that to the south is rich.

Clearly, the maintenance of a properly integrated town structure demands that further development shall be to the north of the trunk road, and this need is reinforced by the demands of agricultural conservation. But if this is to happen a new bridge must be constructed almost immediately, for the traffic demands made on the existing one are already excessive and there are virtually no building sites left on the south of the river. There is, therefore,

every reason to provide for the early construction of a bridge, a costly proposal which might well cause prolonged headshaking in the Ministry of Transport.

Yet the long-term effects of failing to authorise the bridge can readily be seen to be very serious. Good agricultural land will have to be built on instead of poor land and the town will be severed by the trunk road, so that the construction of a by-pass will eventually be essential, whereas both these things would have been avoided by the construction of the bridge. On redevelopment of property fronting the trunk road it would eventually have been possible to abolish that on the south side and deny direct access to that on the north, thus improving the road situation without any new road construction.

If ever a time comes when redevelopment is possible on a really grand scale these problems will diminish in intensity because of the shorter waiting periods involved for those who will benefit by redevelopment.

New or extended central services need to be tied into the town programme in such a way that they come into operation as soon as they can be worked economically. This applies particularly to neighbourhood services such as schools and local shops, the inevitable lack of which, during the early stages of new development, cannot but cause considerable inconvenience.

The increased provision of central area services can be much more flexible. As I have mentioned elsewhere, a central area which has been adequate does not suddenly become grossly inadequate; the pressure on services gradually builds up as population increases until it becomes uncomfortably great. Except, therefore, where very large increases of population are expected within a short period the programming of central area services need not occasion great concern. This, of course, does not apply to the detailed redevelopment of central area building sites, the effective programming of which may well constitute the greatest difficulty of such projects.

9-3. PRESENTATION

Special problems of presentation arise in connection with the town map and its accompanying programme map. I have already outlined in Chapter 3 the general principles which I think should be followed in designing the notation for a town map but some amplification of these is necessary. The principles apply whether one is using colour or monochrome and are exemplified in Figs. 31 and 33. They may be summarised as follows:

Notation used for each use proportionate in intensity to the intensity of that use.

Existing uses to be retained shown more intensely than proposed uses.

Proposed uses likely to be brought about within a fairly definite period, usually taken as twenty years, shown more strongly than uses not likely to be brought about until later. While it is important that the latter should be shown, in order that the intended eventual form of the town may be clear, there cannot be the same degree of certainty about them as for the more immediate proposals, so that they should not be shown as definitely.

This is in a sense, applying programming to the town map, but only in a very special way. Generally speaking, it is essential for a separate map to be prepared to show programming; the town map is too complex to allow of this further important item being shown upon it.

Some confusion is caused by doubt about the appropriate scope of the town map. The town map's main job is to show intended changes of use; it therefore does not show redevelopment, however extensive, where this involves no change of use. It does not show the routes of proposed new roads if of a minor kind, or of road improvements, within such areas, since these have no effect upon the Plan of the town as a whole, and will probably not even have been designed at the time the town map is prepared. On the other hand all important road improvements intended to be carried out independently of riparian redevelopment, whether in the form of new roads or of widenings, should be shown because of their effect on the functioning of the town.

The programme map presents great presentation difficulties. It should show strongly the order in which changes in the town are intended to take place, but to be fully meaningful must also show, though subordinately, what land uses are involved in the areas of change. The Ministry notation shows the land uses concerned with great prominence but reduces the more significant question of sequence to inconspicuousness. In my opinion the best method of resolving this dilemma is to use as a base a copy of the town map in monochrome and to superimpose in varying intensities of a single colour, the sequence of changes, the earliest development being shown most strongly.

It is a matter of some doubt whether, having omitted from the town map redevelopment which does not involve a change of use, one ought to follow suit with the programme map. I do not think one ought, for redevelopment may constitute a considerable proportion of the development contributing to the realisation of the plan, and to omit it is therefore likely to give a misleading impression. The town map should show as clearly as possible the intended eventual form of the town and the kinds of changes needed to bring this about; the programme map should concentrate rather upon the amount of change and the sequence of change.

Fig. 32 is an example of a Programme Map for a Town, somewhat limited by the need to present it in monochrome.

9.4. CONCLUSION

The Town Map is no more than a skeleton based upon approximations, which serves as a guide for more detailed Planning. If properly prepared it ensures that growth and redevelopment shall result in a town with its parts in proper proportion. To judge the town map properly it must be capable of being comprehended *as a whole*. The fact that most of the calculations suggested above as necessary in connection with the preparation of a Town Map are necessarily inexact and liable to be falsified in detail does not in the least detract from the necessity for them. They are, above all, what ensures proper proportion.

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NATHANIEL LICHFIELD

*B.Sc. (Est. Man.), Ph.D., F.R.I.C.S., M.T.P.I., A.M.I.Mun.E.,
Special Diploma in Town Planning of R.I.C.S.*

THIS BOOK was written partly because no other covered the syllabus of "Economic and Financial Aspects of Town Planning and Development" in the final examination of the Royal Institution of Chartered Surveyors, or "Economics of Land Use" in the final examination of the Town Planning Institute. It forms the first attempt in this country to deal comprehensively with economic aspects of town and country planning within one pair of covers. It will, therefore, interest not only the student but also the practitioner concerned with town planning, whether in the planning or other departments of local authorities or in private offices. It is referred to frequently in "Principles and Practice of Town and Country Planning", where its great importance is stressed. The two books, in fact, supplement each other in many ways.

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